

THE *MARINE REVIEW*

VOL. 39.

CLEVELAND,

JANUARY 14, 1909.

NEW YORK

No. 2

Naval Architects and Marine Engineers.

The ninth paper read at the annual meeting of the Society of Naval Architects and Marine Engineers was on the "Service Test of the Steamship Harvard" by Prof. C. A. Peabody and W. S. Leland. It was read by Mr. Leland as follows:

The attention of members is particularly called to the fact that this test was run under the conditions obtaining in actual service, no attempt having been made to approximate the ideal conditions existing on the usual trial-trip runs.

We are much indebted to Mr. R. McGregor, general superintendent of the Metropolitan Steamship Co., for the personal interest he manifested in the test and for the assistance he freely gave.

Observations were taken by Messrs. Young, Fisher, Hubbard and Davis, students of the mechanical engineering department of the Massachusetts Institute of Technology, for thesis work; but the test was made under the direction of the department of naval architecture, and under the personal supervision of the authors. The curves shown on Plates 1 and 2 were plotted by the authors and the results reported were computed by assistants in the naval architecture department.

The engine test began at 9 P. M., when the engine had reached full power, and was stopped at 3 A. M., as we approached Nantucket Shoals. The last reading was taken at 2:55, when the first half-speed bell sounded, and the curves extrapolated to 3 o'clock. The boiler test was begun at 7:10 P. M., and continued until 7 o'clock the next morning, the curves being extrapolated to make 12 hours.

Pressures were read, as far as possible, on the engine-room gages, which were tested for the occasion by the Crosby Steam Gauge & Valve Co. Where engine-room gages were not available, Institute gages tested at our own laboratories were used.

The horsepower was determined by means of the Denny and Johnson torsion meter, belonging to the department of naval architecture at the Institute of Technology. The inductors were so set as to give a clear length of shaft between inductors of 63.06 ft. on center shaft, 47.52 ft. starboard, and 49.21 ft. port, which gave readings of approximately 95, 75, and 70 respectively at full power.

Inductors were set on all three shafts, but during the test the port recorder failed to work at the end of two hours, due to a rupture of the connections. From the few readings thus obtained, and from readings taken on a preliminary run, when it did work satisfactorily, it appears that the torque readings on this shaft were 93 per cent of those on the starboard, and in computing the horsepower this figure has been taken. This, of course, throws some little uncertainty into the calculation, but there is every reason to believe that the assumption is very nearly correct. It would make practically 3 per cent error on this shaft to affect the total horsepower by so much as 1 per cent. The torsion meter can be read only to single units, so that this of itself means an uncertainty in the last digit which corresponds to an accuracy of about 1½ per cent. When, however, the readings are plotted at 10-minute inter-

vals, as is here done, and the results faired, the probable error is likely to be much less.

In computing the horsepower 1.506 based on a torsional modulus of elasticity of 11,600,000 was used for the constant K in the formula H. P.

$$Kd^4rR = \frac{CL}{d}$$

in which d =the diameter of the shaft in inches (8 in.), r =torsion meter reading, R =revolutions per minute, C =inductor constant (12.5), L =length of shaft in feet between inductors.

The shaft was not twisted to determine the exact constant, but since 11,600,000 is the mean angle of a large number of tests it cannot be far from right. We find 11,000,000 and 12,000,000 to be practically the minimum and maximum values, showing a variation of about 3 per cent only in extreme cases. That the actual modulus of the Harvard's shaft should vary from the mean value by more than 1½ per cent is extremely improbable. All in all, taking into account the uncertainty of the port shaft, there is every reason to believe that the horsepower is subject to an error less than that of the ordinary steam engine indicator.

The water consumption was measured by a 6-in. Hersey hot water meter loaned by the Hersey Manufacturing Co., of South Boston. It was installed in the suction line between the hot well and the feed pump, and gave exceedingly satisfactory results. This meter was previously calibrated by the Hersey Co. and indicated an under-run of 1 per cent under the conditions of the test. The curve of meter readings was plot-

ted without this correction, so that 1 per cent should be added to any ordinate of that curve to get the correct reading.

Steam for all the auxiliaries excepting the blowers came through the starboard pipe only, in which a thin plate having a $2\frac{1}{2}$ -in. orifice was inserted. The valve on the port line was tightly closed and the by-pass around the reducing valve on the aux-

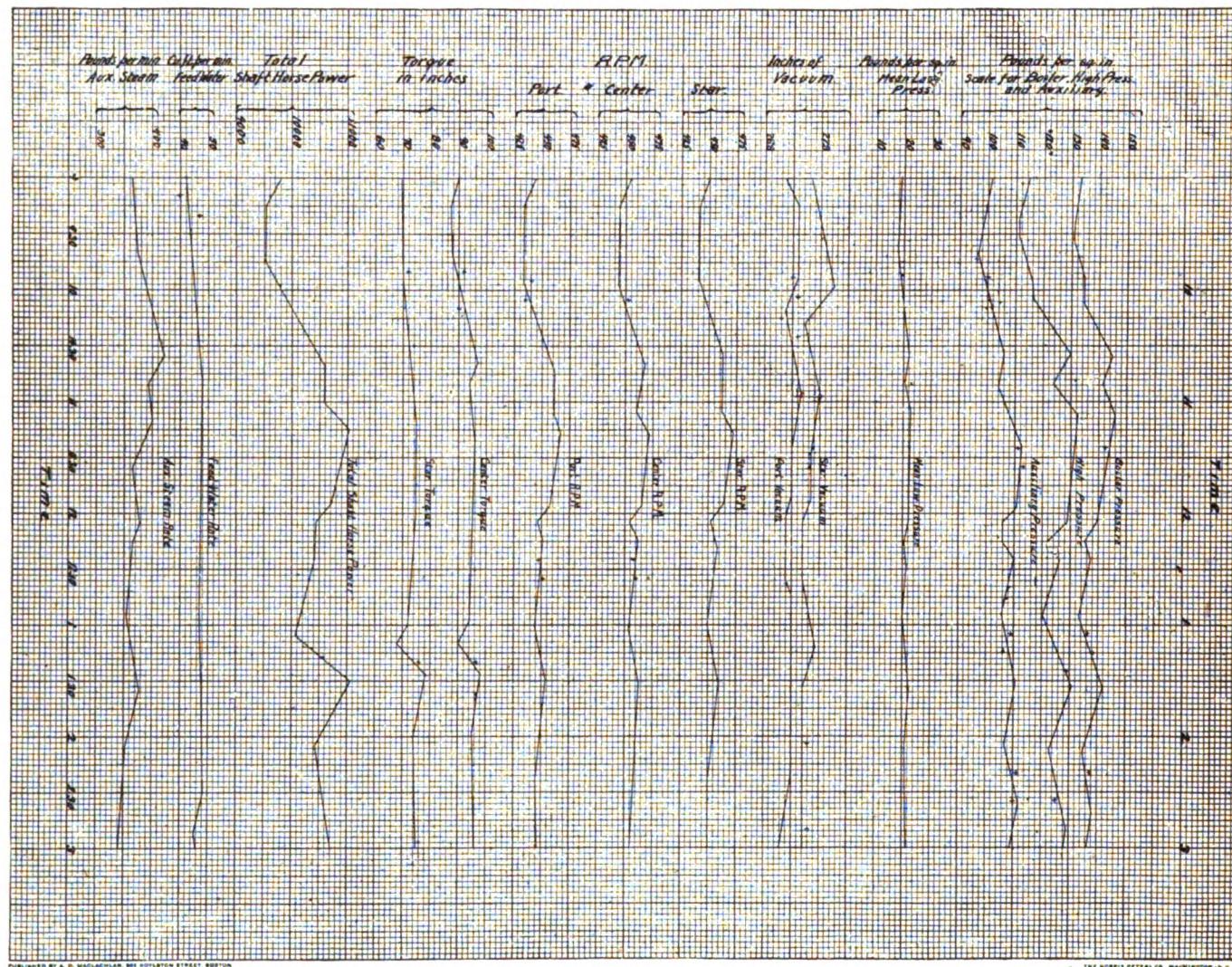
iliary line opened so that all the reduction in pressure was due to the orifice. The reduced pressures were read on the auxiliary steam gage on the engine room gage board and the flow of steam computed from co-efficients determined by experiments made at our engineering laboratories. An independent orifice was necessary for the blower engines as this steam did not come from the auxiliary line. The curve of auxiliary steam consumption shows the total from these two orifices.

The probable error in determining the auxiliary steam is small. The

gage pressures were read to the nearest pound every 10 minutes and the average must be very nearly right. An error of 1 pound in this average would mean about 2 per cent error in the total auxiliary steam, but even if the error here were four times as great it would be of small moment, for the auxiliary steam is only about 13½ per cent of the total.

The coal was determined by count-

siderable in so short a run. There is every reason to believe that any determination for so short a run would be somewhat too small. Our figures seem to show 80 tons for 12 hours equal to 100 tons for 15 hours, the running time from dock to dock, and this figure checks remarkably well with the amount of coal actually placed on board, an average being taken over a large number of trips.



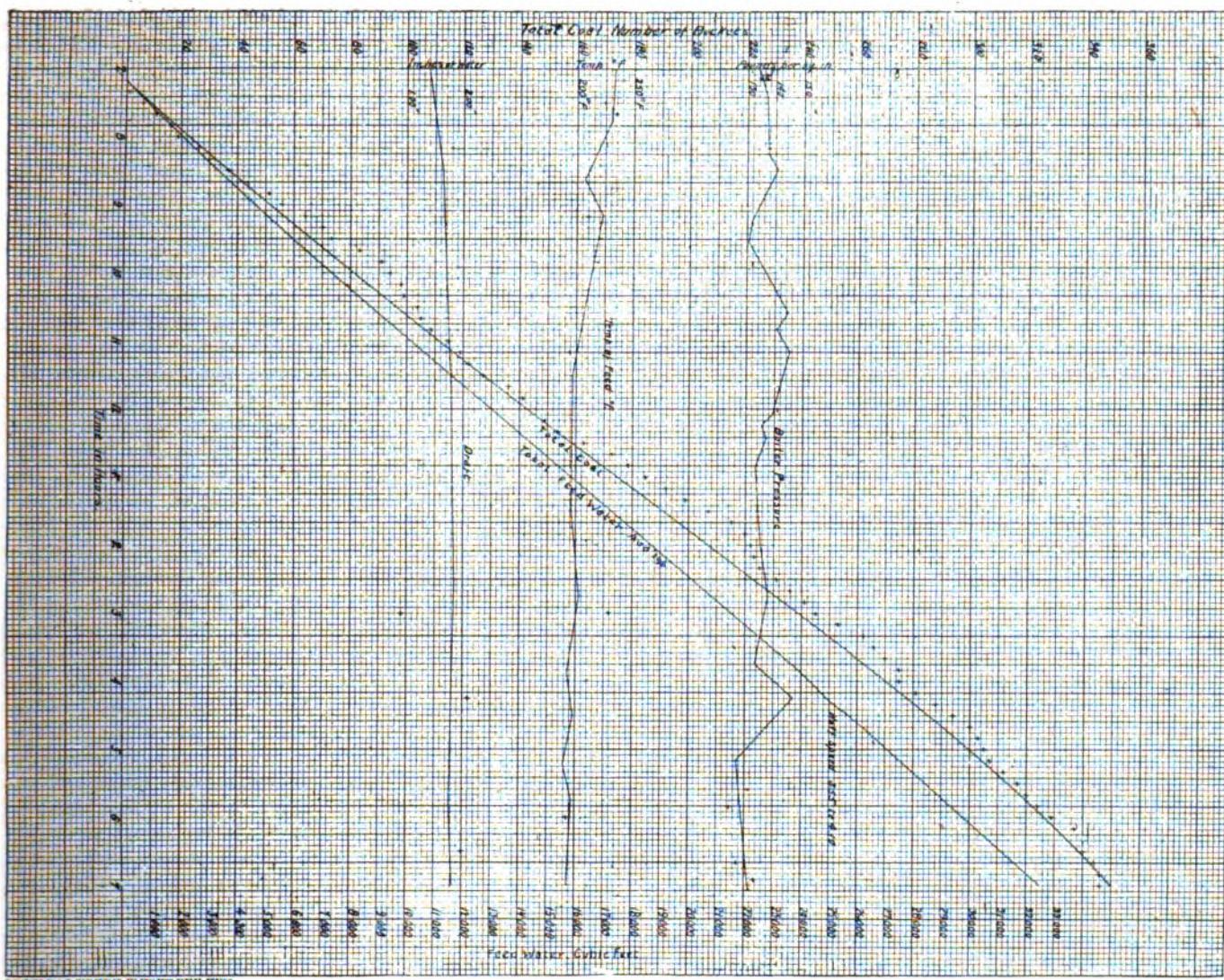
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ing the buckets dumped on the floor. The points plotted on Plate 1 show the numbers of buckets at 10-minute intervals. Every hour the amount of unburned fuel on the floor was estimated, the corresponding points plotted, and the coal consumption curve drawn through them. The average net weight of coal was 506 lbs. per bucket. Such a method as this for coal determination is open to question, but is perhaps the best that can be adopted on a short sea run. Even had the coal been weighed, the different condition of the fires at start and finish might have been con-

The quality of steam was determined by the throttling calorimeter, the sample being taken from a tee on the top of the steam main, inserted for this purpose where the pipe was tapped for the gage connection.

Plate 2 shows the plots of engine test data. For the sake of simplicity only those observations appear in the plot which vary from the curve by an amount greater than the possible accuracy of observation. The close similarity of the curves and the small number of points through which the curves do not pass, is a strong check on the accuracy of the observations.



The following tables give the summary of the results and the principal dimensions of the vessel:

DIMENSIONS.

Length between perpendiculars.	386 ft. 6 in.
Breadth of hull molded.....	50 ft. 6 in.
Breadth over guards.....	63 ft.
Depth molded.....	22 ft.
Draught normal.....	16 ft.
Draught at trial (mean new York to Boston).....	16 ft. 2 in.

RESULTS OF BOILER TEST.

Date of test.....	June 25, 1908
Duration of test.....	12 hrs.
Boiler pressure average gage.....	137.8 lbs.
Quality of steam.....	95.9
Barometer.....	29.97 in.
Temperature of feed water.....	203°.5 F.
Draught of blowers (Howden).....	1.71 in.
Number of boilers (single-ended Scotch).....	12
Total grate area.....	756 sq. ft.
Total heating surface.....	29,520 sq. ft.
Ratio heating to grate area.....	38.6
Total coal fired in 12 hrs.....	179,112 lbs.
Total water fed in 12 hrs.....	2,041,710 lbs.
Equivalent evaporation from and at 212° per lb. of coal.....	11.2
Coal per sq. ft. grate.....	19.6

RESULTS OF ENGINE TEST.

Type of engine.....	Parson's turbine
Duration of test.....	6 hrs.
High-pressure gage.....	124.4 lbs.
Low-pressure gage, average S. & P.	21.3 lbs.
Vacuum (average S. & P.)....	27.42 in.
Temperature of injection water.....	63°.5 F.
Temperature of discharge water.....	107° F.
Temperature of hot well.....	110°.8 F.
Total water per hr. during test.....	176,010
Maximum revolutions.....	p. 468, c. 472, s. 472
Minimum revolutions.....	p. 433, c. 444 s. 441

Average revolutions (6 hrs.)...

455

11,076

Minimum shaft H. P.....

9,525

Average shaft H. P. (6 hrs.)...

10,405

Steam for auxiliaries per hr...

22,380 lbs.

Steam (4 per cent primings) per shaft H. P. per hr, all purposes

16.9 lbs.

Steam (4 per cent priming) per shaft H. P. per hr, turbines only

14.76 lbs.

B. T. U. per shaft H. P. per minute

265.9

Coal per shaft H. P. (average of 6 hrs.).....

1.5 lbs.

DISCUSSION.

Prof. Peabody: I ask permission to append to this paper as additional information some figures given to me by Mr. McGregor, the superintending engineer of the Metropolitan Steamship Co.

"Average Performance of Turbine Steamers Harvard and Yale from May 11, 1908, to Nov. 8, 1908, on regular service of the Metropolitan Steamship Co., between New York and Boston.

"Part of the running time was on route via Long Island Sound and part by the all ocean route; Long Island route, 298 knots; ocean route, 326 knots.

"In time given from dock to dock no deductions have been made for stop-

pages nor for time ships were anchored due to fog, etc.

"No delays have been caused by derangement of machinery nor have there been any repairs made or required to turbines."

	Harvard.	Yale.
Number of trips.....	178	179
Average knots per trip.....	301	303
Total knots run.....	53,578	54,237
Hours dock to dock.....	15:15	15:34
Hours steaming	15:01	15:12
Mean draught	15' 10"	15' 11"
Average knots per hour.....	20.05	19.93
Coal received per round trip, tons	238	240
Coal steaming per trip, tons.....	106.5	107
Coal per hour, tons.....	7.10	7.04
Port use, tons.....	12.5	13
Knots per ton	2.826	2.831
Average R. P. M.....	441	443
Average boiler pressure	146	151
H. P. turbine pressure	124	125
Vacuum average	28½"	28¾"

Prof. Peabody: The things I wish to call attention to at the present moment in connection with this additional data are these, namely, that the number of tons of coal used in steaming per trip for the Harvard on the average for 179 trips is 106.5, and for the Yale on the average, 179 trips, was 107 tons.

I do not know that it is necessary to read any of the other figures in this

additional paper, as they will be appended to the paper.

The President: The society is in receipt of some remarks on this paper by George H. Barrus, which I will ask the secretary to read.

REMARKS BY MR. BARRUS.

The secretary then read the following:

I am very glad to see the Massachusetts Institute of Technology advertised before this society, for I am a "tech" man myself, and I feel that its activities are worthy of publicity. I am sorry, however, that it has been brought into notice through the medium of such a test, for I wish to assure the members that, in my belief, the institute work, apart from this example, is of a far higher class than that which forms the basis of the paper before us.

The paper appeals to me personally because I have been conducting steam engineering tests all through my professional life—a period of 33 years. My own work, it is true, has been largely confined to boilers and engines on land; at the same time, I have had a fair amount of experience in steamship tests. It may not be out of place to mention, in passing, that the distinguished professor, who is the leading author of the paper, when a student at Technology in 1877, was one of my pupils in the institute's steam engineering laboratory at the time I was conducting the Dixwell experiments on superheated steam.

I speak disparagingly of the paper because there are a number of things about the test which cannot be endorsed. I will endeavor to call brief attention to them.

1. I do not endorse the method of determining the coal consumption by counting the number of buckets of coal dumped, guessing at the weight of most of them, and guessing at the amount of coal on the floor not fired. No code of rules for conducting boiler tests or engine tests ever sanctioned guess work of this kind. I presume it was an easy way to make the determination, but the easiness of this method is no excuse for discarding all the well-known requirements for insuring reliability in the determination of the most important element in the performance of a steam plant.

2. It is evident from the remarks of the paper that no allowance was made for the different conditions of the fires at the start and finish, which the report says might have been considerable, and I judge that no observations of their condition were made. I do not endorse any boiler test which does not take into account these important conditions. Furthermore, no coal test is reliable unless started and stopped in such a way that

the condition of the fires can be properly estimated, and a proper allowance made for any difference. In the absence of information on this point, I regard the determination of the coal fired on this test as no indication whatever of the amount of coal actually consumed.

The chances are that at the beginning of the run the furnaces were well stocked with clean coal, while at the end of the run they were probably filled with a mixture of coal and ashes; and the difference in the amount of coal represents a certain quantity which was actually burned but not included in the weight of coal charged to the test. In other words, the weight of coal actually burned was probably much greater than that fired and reported in the table of results.

3. I do not endorse the method followed in determining the correctness of the water meter. This was left to the manufacturers of the meter, who calibrated it some time before the test, presumably at the factory. A meter ought to be calibrated in place under the precise conditions of use, and it ought to be done by the persons who are conducting the evaporative test. I have used a great many hot water meters in test work, and I have always found this to be one of the essentials of reliability.

4. I do not endorse the figure 11.2 given in the report as the equivalent evaporation from and at 212 degrees per pound of coal. This is merely a question of correct arithmetical computation from the data given. Using the figures given in the advance copy of the paper which are

Total coal fired.....	179,112 lb.
Total water fed.....	2,041,710 lb.
Boiler pressure	137.8 lb.
Quality of steam.....	95.9 per cent
Temperature of feed water.....	203.5°

my computation gives 11.53 pounds from and at 212 degrees per pound of coal instead of 11.2 pounds.

5. My principal reason for criticizing the coal and water measurements is that the evaporative result is well nigh impossible of attainment under the conditions stated. In speaking upon this point, however, two assumptions must be made. One is that the weight of coal given is the weight uncorrected for moisture, and the other is that the coal was a fair grade of semi-bituminous, which is common in the eastern market. On these points I make the following assumptions:

Percentage of moisture in coal.....	3
Percentage of ash and refuse actually produced	10
B. T. U. per lb. of dry coal.....	14,500
B. T. U. per lb. of combustible.....	15,300

With these assumptions, which in every case correspond to good practice, the evaporation is 11.87 pounds of water from and at 212 degrees per pound of

dry coal, and 13.19 pounds per pound of combustible; also, the thermal efficiency based on dry coal is 79 per cent, and on combustible 83 per cent. Everyone familiar with boiler performance knows that such results as these are well-nigh impossible in any hand-fired boiler, whatever system of operation is employed, if worked under the conditions pertaining to this test. I have personally conducted hundreds of boiler tests, but I have never obtained so high a percentage of efficiency as 83 per cent.

6. I do not endorse the incompleteness of the work which characterizes this test. So far as the report gives any intimation there was no determination of the temperature of the flue gases, the temperature of the air supplied to the furnaces from the Howden system, the force of blast in the ash pits, the force of draft in the furnace, the composition of the flue gases as determined by gas analysis, the moisture in the coal, or the kind of coal, all of which are quite as important to the engineer as the meager statement of the evaporation per pound of coal. There is also a notable lack of information regarding the boiler dimensions, and the dimensions of the Howden apparatus, to say nothing of details in regard to the Parsons turbines and auxiliaries. It has always seemed to me that the results of tests are of little value to engineers unless accompanied by full information in regard to the plant from which they are taken.

7. Finally, I do not endorse the method of determining the shaft horsepower. Leaving out of consideration the breakdown which occurred, and which threw out the indications of one shaft meter, the horsepower is based on an assumed torsional modulus of elasticity. An assumption of this kind is far from satisfactory. The only reliable figure is one which is actually determined upon the individual shafts in use. As the paper states that this was not done there is doubt as to the reliability of the shaft horsepower given.

8. I regret to make these adverse criticisms of a paper which has been passed upon by the officers of the society, but I for one desire to see data in the published transactions which is not only interesting, but absolutely reliable, and open to no question. If it is not thus reliable, it should be excluded from the transactions.

The President: I hand the secretary some comments on this paper by Clinton H. Crane, which I desire the secretary to read.

The secretary read the following:

PAPER BY CLINTON H. CRANE.

I have read Prof. Peabody's paper on the "Coal and Water Tests of the

"Harvard" with a great deal of interest, particularly as we have been running some very extensive tests on the turbine yacht Vanadis with the idea of determining coal and water consumed.

From our own experience, I am strongly of the opinion that the meter readings as given by Prof. Peabody are incorrect.

We ran three separate tests on the Vanadis, and had installed a Neptune water meter in the feed line which had been previously calibrated by the meter company. In the last of the three tests when the working parts of the meter were in perfect order before and after the tests, we got the following result:

Coal per hour, 3,086 pounds as a mean of 24 hours.

Water by meter per hour, 34,131 pounds.

Water by actual measurement in barrels, 29,188 pounds.

The measurement in barrels was a measure of all water passing through the condensers for a period of 45 minutes, during which time we actually handled 21,891 pounds of water. The water in the barrels was measured with a measuring stick, the barrels having been previously calibrated by filling on the scales.

We were using the same coal as used by the Metropolitan line, or possibly a little better quality.

Prof. Peabody's evaporation shows over 11 pounds. Our calorific test of coal gives us slightly over 14,000 British thermal units, which makes me feel that the boiler efficiency, as apparently determined on the Harvard, is away beyond what we can reasonably expect. On the other hand, I think we have a right to expect far better turbine efficiency than 16 9/10 pounds per hour at the speed at which these ships are running. Of course, this does not affect at all the question of coal per shaft horsepower hour, but I think it will be too bad if the average engineer, on the basis of these figures, should figure on obtaining anything like the evaporation stated from ordinary American coal.

The President: The paper is now open for general discussion.

REMARKS BY W. CARLILE WALLACE.

W. Carlile Wallace: I have read this paper with considerable interest, and there are one or two points which I would like to comment upon. In the first place, I would like to know how the B. T. U. per shaft horsepower per minute is arrived at. This figure 265.9 seems to me to be incorrect, unless I am mistaken in the way it is arrived at.

Now, with regard to the remarks of some other speakers, I notice in this

paper we are not given the calorific value of the coal. This appears to me to be a decided omission, because the boiler efficiency is a very important one, and it is entirely neglected. On the other hand, I do not agree with some of the other remarks that it is impossible to get an evaporation of 11.2 per pound of coal, at 212 degrees, with good Scotch boilers. That I have gotten, and considerably more, at the rate at which they were burning in this case. In this case the coal is very bad.

Another point is that the moisture in the coal is not given. Of course, when the calorific value of the coal is not given, the moisture is of no account, because you cannot do anything with one without the other.

As to the use of the water meter for a really scientific test, in my opinion it is utterly valueless, but unfortunately at sea it is difficult in service to get any other way of measuring the water. The only real way, of course, is to measure the water very carefully in tanks, and in that way arrive at an absolutely accurate weight, or weigh the water. That, of course, would be an impossible undertaking with the amount of water that is used.

With regard to the coal measurement, it is possible to arrive at a fair estimate of coal if great care is taken in striking off the buckets carefully, but the most satisfactory way for trials is to have all your coal weighed carefully in bags, put on the plates, or let down as the coal is burned. Of course, it is a troublesome and expensive method, but you get accuracy as far as the weight is concerned, and then again there must be great care taken in estimating the coal both at the time of starting on the bars, and at the time the trial is over, and that is a very fruitful cause of error.

WATER METERS IN MARINE TESTS.

E. A. Stevens: I had occasion to use water meters in marine tests, and I have found in calibrating them before and after the test that the two calibrations very rarely agree. The temperature of the water seems to effect most of the meters. The ones I got the most satisfactory results with were some old-fashioned Worthington's, positive displacement meters.

As to the general criticisms on this paper, I want to say a word as to the methods under which such tests usually have to be conducted, somewhat in the line of what I wrote about trial trips yesterday. The observer is generally at a considerable disadvantage in conducting a trial on a ship which is at business and working and earning money, and at-

tempting to make any refined test on her. The demands of the service are such, as usually to forbid going into such refinements as the weighing of coal. I tried to do that in several cases, in trying to get at the actual service consumption of the trip, but the service of the vessel and the cramped room available has generally been such as to render accurate weighing impossible, and weighing merely resolves itself into a system of verification of previous estimates, made on some other basis, such as I presume these were made on.

I quite appreciate also the absolute impossibility of working a system of tanks on vessels in service with the room I have ever found available for that purpose. Of course, Mr. Barrus' remarks as to the character and scope of the plant, and the information conveyed by knowing its dimensions, are perhaps a well founded criticism, but it is not always possible to get these details and publish them. I do not know whether that is so in this case, but I know in other cases in which I have been interested, the builders or owners, for some reason or other, have refused to allow the publication of such details.

Robert McGregor: My official capacity in connection with the steamers Harvard and Yale, in operating this season, I will say that we commenced the season on May 11 and closed on Nov. 8, making 178 trips. It seems to me that the chief point of contention in this discussion is the question of coal consumption, and how the amount is arrived at. Any man knows the absolute impossibility of trying to weigh out every package of coal, and expect to get accurate results. I have taken 178 trips, and on this service each trip is practically the same. It gives a consumption of 7.10 tons of coal per hour on the steamer Harvard, as against 7.04 of coal per hour on the steamer Yale. Now, this amount of coal is coal which is actually paid for, and it is not my experience in New York that you get any more coal in weight than you pay for. (Laughter.)

I was present at the test made by Prof. Peabody, and I consider the care and experience shown in that test as reflecting great credit on all concerned. The representatives of the institute were aboard the vessel for a week in testing and applying apparatus, and personally I consider the results fairly accurate.

Speaking of the steamer Harvard, I might mention that during the whole season we have not had any trouble whatever with the main engine and turbines themselves. In comparing this class of engine with reciprocating engines, I might say in my opinion it is

almost impossible that a service test, such a severe service test, could be run by any form of reciprocating engine, and maintain as creditable performance, when we consider that in the 178 days that these steamers will make a total distance of 53,578 knots, with absolutely no ad-

justment or expense whatever connected with the main parts of the machinery.

I think our thanks are due to a certain extent for the trouble taken by Prof. Peabody in giving this paper, and I, for my part, think it very creditable.

(To be Continued.)

Birthplace of the New White Star Leviathans, to be Over 900 Feet Long.

The preparations for the construction of the mammoth White Star liners Olympic and Titanic at Messrs. Harland & Wolff's yard at Belfast are almost completed as will be seen by the illustration of the enormous structure which covers the two slips on which the new ships are to be built. Of course the visible structure is only a part of the preparations, the slips themselves having undergone a complete transformation before the gantries could be constructed on the site. The amazing erection is a web-work of steel girders nearly 300 ft. high,

lifting from 5 to 40 tons, and there is also provided a cantilever arm reaching out 137 ft. in any given direction. A special correspondent of the London *Daily Mail* has had an interview with the Right Hon. A. M. Carlile, the general manager of Messrs. Harland & Wolff, and although the official dimensions of these leviathans cannot be made known he supplies the following interesting particulars:

Vast as the preliminary outlay is, the Olympic and Titanic could not come into being without these gantries, for they simply dwarf all that



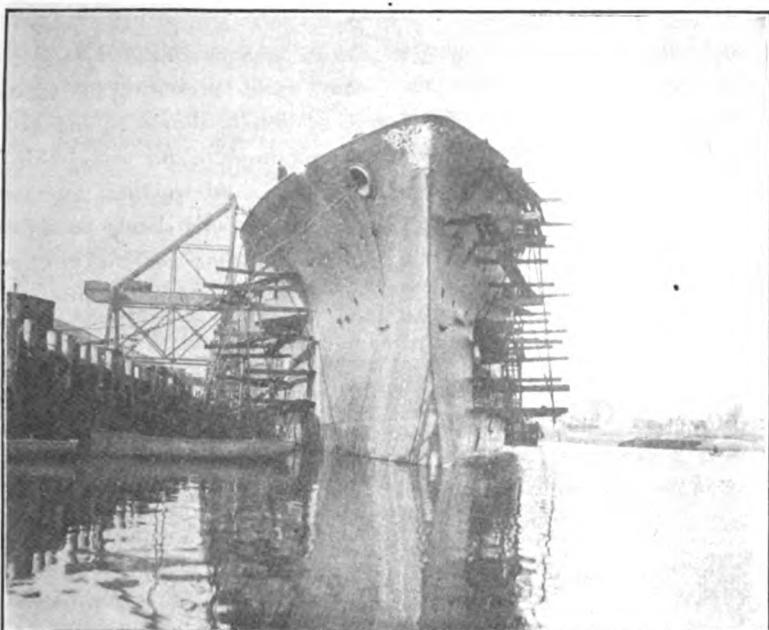
BUILDING BERTHS FOR THE OLYMPIC AND TITANIC.

300 ft. wide, and 850 ft. long, and cost about \$1,000,000. It extends over the length and breadth of the three berths whereon such vessels as the Adriatic, Baltic and Celtic have been built. The foundations of these berths being "slob" has had 10,000 extra piles driven into it, and ferro-concrete at the rate of 2,000 tons each 24 hours is being laid in order that the floor may bear being depressed unevenly by a weight of 75,000 tons. The gantry is provided with 29 electric cranes

have ever gone before, even those marvellous vessels the Lusitania and Mauretania. As to the Great Eastern, leviathan born out of due time, since even now she dominates the imagination of many, be pleased to compare her principal dimensions with these latter day wonders. She was 25,000 tons displacement, they (the new White Star liners) 60,000 tons, she drew when laden 30 ft., they 37 ft., her length was about 600 ft., theirs between 900 and 1,000 ft. (exact par-

ticulars are not available in this particulars; her combined horsepower was 3,000, theirs 50,000—for they are not to be considered fast ships, only they will not steam less than 21 knots. They will each have four funnels and one mast. Their stern frames, cast in one vast forging, will each weigh 300 tons, the rudders each 100 tons, 15 cwt., and for a swift transition the main dining saloon will seat 600 diners at once. Their correspondent goes on to say: One thing I was curious about was the mighty floating crane which Messrs Harland & Wolff have had constructed in Germany at enormous cost, to lift a weight up to 175 tons from any position afloat. Why in Germany? Because no British firm could or would undertake such a job, and Harland & Wolff must have up-to-date tools, this one like all the others having electrical motor power. I must point to a portent, for it is nothing less. Here is, beyond question, the greatest shipbuilding works in the world, having at the present time 13 vessels on hand, ranging from 60,000 tons to 6,000 tons. The men are working day and night, the yard is being exploited to its utmost capacity, no specter of unemployment looms before its army of employes. Yet every pound of coal as well as of material has to be imported. There are no coal and iron mines, foundries, etc., behind it to draw from as so many yards have that have suffered and do suffer from lack of work. Into the economies of this wonder I cannot enter. I can only point to it and say, What does it mean? Another matter which should never be lost sight of in considering the work of this wonderful firm in connection with the progress of the White Star Line is that they have worked together upon a basis of mutual confidence, an utter absence of contracts, and of any kind of hitch ever since they commenced building the pioneer "Oceanic" in 1870. It is a splendid record of commercial integrity of which any firm might well be proud, and one cannot but rejoice that it has been so well and amply rewarded.

The steel steamer Northland, built last year at Moran's for the Northland Steamship Co., Tacoma, Wash., went ashore on Enterprise Reef at the entrance to Active Pass Nov. 26. She was later released by the Canadian Pacific steamer Princess Royal and towed to a favorable spot where she could be beached. The Northland is not seriously damaged.



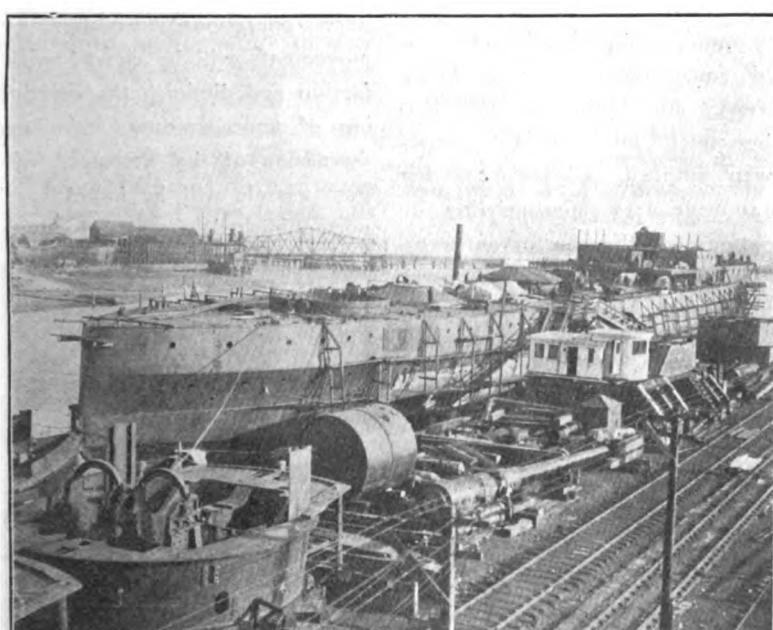
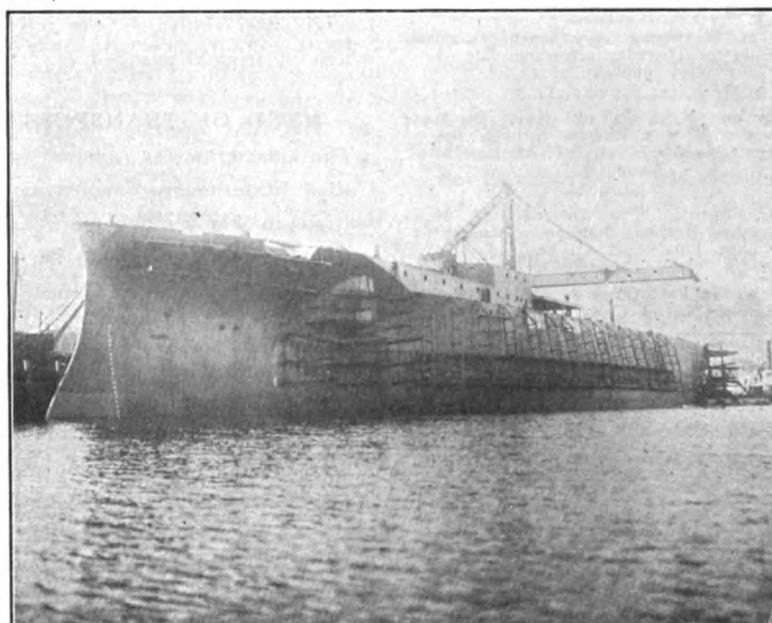
BATTLESHIP NORTH DAKOTA.

Herewith are published three views of the battleship North Dakota, taken on Dec. 16, one year after the laying of the keel, and showing her 65 per cent completed, a commendable record for the Fore River yard.

COAL FLEET AT PITTSBURG.

River coal operators of the Pittsburgh district recently decided to stop production at the mines until enough water has come to enable them to start at least a part of the 1,350,000 tons now loaded in boats on its journey south. The upkeep of this enormous amount of coal aggregates \$5,000 per day and it has been about 220 days since the last fleet of coal boats left Pittsburgh for the Mississippi valley, the longest stretch known without navigable water.

The coal has accumulated until there is now the biggest fleet of loaded boats



on record and it is admitted that the operators cannot expect to sell the coal at a profit even were the fleet to start tomorrow.

Meanwhile, the southern coal fields with rail connection to the southern market and with short hauls are working into the trade controlled for the past half century by Pittsburgh. This causes more apprehension among coal operators than does the fact that 1,350,000 tons of coal are tied up with no prospect of getting out.

NAVAL DRY DOCK BEGUN.

Work began Dec. 31 on the construction of the new dry dock at the Puget Sound navy yard at Bremerton, Wash. The contract is held by C. J. Erickson, of Seattle, Wash., and it is expected that at least three years will be required for the completion of the dock.

The contract price of the dock is about \$2,000,000 and it is to be 820 ft. long, and 95 ft. wide. It is estimated that about 300,000 cubic yards of earth will be removed before the dock is complete.

Crawford & Reid, Tacoma, Wash., are to build a "one-man" tug for C. A. Norton, of Anacortes, Wash., to be 48 ft. in length, 11 ft. beam and 5 ft. deep. She is to be fitted with a 50 H. P. Imperial engine. The construction is to be of heavy oak and she is to be ready for service in 60 days. The engine will be installed in the cabin, under the forecastle head and the pilot house is to be partly over the engine. The engine control will be carried into the pilot house and also up beside the wheel. The tug will have the best features of her class, including power capstan for handling tow lines and anchors.



DEVOTED TO EVERYTHING AND EVERY
INTEREST CONNECTED OR ASSO-
CIATED WITH MARINE MATTERS
ON THE FACE OF THE EARTH.

Published every Thursday by

The Penton Publishing Co.
CLEVELAND.

BOSTON.....73-74 Journal Bldg.
BUFFALO.....932 Ellicott Sq.
CHICAGO.....1328 Monadnock Bldg.
CINCINNATI.....First National Bank Bldg.
NEW YORK.....1005 West Street Bldg.
PITTSBURG.....510 Park Bldg.
SEATTLE.....302 Pioneer Bldg.

*Correspondence on Marine Engineering, Ship
Building and Shipping Subjects Solicited.*

Subscription, U. S. and Mexico, \$3.00 per
annum. Canada, \$4.00. Foreign, \$4.50.
Subscribers can have addresses changed at will.

Change of advertising copy must reach this
office on Thursday preceding date
of publication.

The Cleveland News Co. will supply the trade
with the MARINE REVIEW through the
regular channels of the American
News Co.

European Agents, The International News
Company, Breams Building, Chancery
Lane, London, E. C., England.

Entered at the Post Office at Cleveland, Ohio,
as Second Class Matter.

January 14, 1909.

**PACIFIC COAST SHIPPING DE-
MORALIZED.**

Concerted efforts are being made by the various chambers of commerce on the Pacific coast to relieve the depression now existing in shipping affairs caused by the unusual number of foreign bottoms that have been loosed upon the trade. These foreign ships were chartered by the navy department to carry coal to the Pacific coast. Obviously as soon as they had discharged their cargoes they sought return cargoes upon any terms. The result was that their presence in Pacific waters utterly demoralized the Pacific coast trade. They not only took business away from ships of American register but they established a ruinous price for water-borne commerce in general. The two trades that have been hit hardest are the wheat trade to Great Britain and the lumber trade to Australia. These foreign ships have also entered into the Phil-

ippine trade and are carrying supplies to the Philippines at a price that would be a severe loss to an American vessel. The foreign ships take it because it gives them employment part way on their long journey home. These colliers have also demoralized the Pacific coast trade to the Panama canal.

All this has been brought about by the action of the navy department in chartering foreign ships as colliers. It would have been better to have paid ships of American register a living rate. Pacific coast interests are now demanding that if further foreign colliers are chartered it should be upon a time charter basis, that is to say, that it should be stipulated that the foreign ship return to the port from which it originally sailed.

NEED OF TRANSPORTS.

The quartermaster general of the United States army devotes some attention in his annual report to the need of suitable vessels to be used as transports. Incidentally he recommends ways in which they may be procured, but adds that any plan of encouragement to American shipping which would place in reach of the department suitable vessels for transport duty in military operations involving over-sea movements would be viewed with satisfaction and diminish the existing feeling of unpreparedness. Quartermaster General A. B. Aleshire in his 1908 report says:

"The opinion has already been expressed (quartermaster general's annual report for 1906, page 28) that this department might advantageously be given authority of law, together with an adequate appropriation, to take options for the charter of American vessels suitable for transports, paying therefor a reasonable yearly rate, fixing the charter price if called into service, and giving the department first right to the service of such vessels when needed.

"It was then and still is the opinion that this would encourage the building of ships adapted to transport uses and place this department in po-

sition to command their services. The law could prescribe in what trade these vessels should be engaged in order to promote our trade with foreign countries, and whether the rate to be paid for options should be a fixed sum per month, or year, a rate per ton, or some other of the different plans, considered in connection with the encouragement of American shipping. The secretary of war should be empowered to require that vessels to be built with the object of being so optionally chartered to the government should comply with certain requirements in the way of construction, speed, equipment, etc., to render them readily convertible into transports. This office has these requirements well worked out, and regulations thereon could be established with practically no delay.

"Another plan has been suggested whereby the government would build transport vessels to such number as would insure transportation being available for a reasonably large expeditionary force and charter them for foreign trade under proper conditions as to payments, field of operations, nationality of crews, etc. That plan could also be put into effect by this department with little delay, were it authorized by law and funds appropriated. Any plan of encouragement to American shipping which will place within reach of the department suitable vessels for transport duty in military operations involving over-sea movements will be viewed with satisfaction and diminish the existing feeling of unpreparedness. An excellent discussion of the war need of transport vessels will be found in the report published in senate document No. 225, sixtieth congress, first session, beginning on page 41, to which attention is invited."

Secretary of the Navy Newberry has recommended to the committee on naval affairs that the new naval program consist of four battleships of 25,000 tons, four submarines, 10 destroyers, three colliers, one repair ship and one ammunition ship.

MASTER'S LICENSE SUSPENDED.

The local inspectors of steamboats at Detroit have suspended the license of Capt. John Davis, master of the steamer Chicago, of the Western Transit Co.'s fleet, for six months, for attempting to pass the steamer Masaba while upbound in the vicinity of the Limekiln Crossing. Masters of bulk freighters have frequently complained about the actions of the masters of package freighters when navigating the rivers. The decision is therefore quite important and is as follows:

"After carefully reviewing the evidence submitted at the trial of Capt. John Davis, of the steamer Chicago, said trial being the result of complaint filed with this board by the master of the steamer Masaba, against the master of the Chicago, for attempting on July 12, last, to pass the steamer Masaba while both steamers were proceeding upbound in the vicinity of Limekiln Crossing, lower Detroit river (willfully and recklessly) and in violation of the provisions of rule VIII of the pilot rules of the great lakes and their connecting and tributary waters.

"This board finds, first, that Capt. Davis, of the Chicago, did violate the provisions of the rule governing the situation, as laid down in said rule VIII, and that said violation was willful, inasmuch as it is shown by his own statement that he knowingly and intentionally attempted to pass to port of said steamer Masaba without the proper exchange or agreement of signals as provided for in the rules.

"It is also shown in Capt. Davis' testimony that his steamer was running at about the rate of about 14 miles per hour and that this speed was maintained in her effort to pass the Masaba until check signals were given her by the patrol steamer. This attempt to run by the Masaba at such high rate of speed, constitutes, in our opinion, recklessness of a very grave order, on account of the almost certain result of causing the overtaken steamer to shear and perhaps go aground on the rock bank of the channel, and especially reckless in view of Capt. Davis' statement in which he says that it was 'kind of hazy, so much that in the middle of the island where I attempted to pass the Masaba I couldn't see above the crossing.'

"We cannot see how a pilot in charge can justify his action in running at a 14-mile clip, into a rock-bound, narrow channel where the movements of vessels are restricted

for the purpose of preventing accident and safeguarding the interests of life and property, with the deliberate intention of passing another steamer proceeding in the same direction without the proper exchange of signals, and at the same time confessing that he could not see clearly ahead, but for a short distance, on account of haze; there is in our opinion no justification whatever under, or authorized by rule VIII, for Capt. Davis' action in this case, for there was not immediate or unforeseen danger to avoid, until Capt. Davis made it so by deliberately and unlawfully putting his own steamer in such a position as to make the situation dangerous.

"In view of the above, it is the opinion of this board, that Capt. Davis is guilty of willful violation of rule VIII of the pilot rules, and reckless navigation on the occasion complained of. We do, therefore, hereby suspend the masters' and pilots' license of Capt. John Davis, the accused, for a period of six months, effective Dec. 31, 1908."

REMOVING IMPORT DUTIES ON GRAIN.

Capt. J. J. H. Brown, of Buffalo, has submitted the following resolution to the Buffalo Chamber of Commerce and has vigorously urged its adoption:

Whereas, The surplus product of all the great grain producing countries of North and South America, as well as Russia, Egypt, India and Australia, finds its way to western Europe for market, and the prices in western Europe fix the grain prices throughout the world, so that the price of wheat at Manitoba and Dakota, for instance, is equal to the price of wheat in London and Liverpool, less the cost of getting it there; and

Whereas, The surplus wheat products of the United States, as well as of Canada, are marketed in Europe, and the prices of wheat on the farms of the United States and Canada are fixed by the prices in the great European markets, the admission of Canadian grain free of duty would have no effect on the price of grain in the United States, and would not affect our home market in any way, as to the extent Canadian grain was used by our millers, the product of the farms of the United States would find a foreign market at equal prices.

It therefore appears to us, that the removal of import duties on grain, and especially of the duties on wheat, would work to the advantage of the transportation interests of our country

without injuring any other interest, as follows:

The grain carrying trade of the great lakes has decreased through our ports, while other commodities have very greatly increased, and on the other hand, by reason of the duty on grain, no Canadian grain is sent over our transportation routes, or shipped from our ports except when the volume of business is too great for the Canadian routes, when the excess is shipped to Buffalo, and thence to our sea ports, in bond. The removal of the duty would regain for our transportation routes this great and increasing volume of business, to the advantage of our water and rail transportation, and as before stated, without detriment to any other interest, and all the profits that follow the transportation of grain from the producer to the consumer, would fall into American pockets.

Whereas, There is no locality in the United States so much concerned in this question as the port of Buffalo, unless it is the port of New York.

Be It Resolved, That this problem be presented to the proper committees of congress, with copies of these resolutions, and the request that they give attention to the problem hereby suggested, to the end that the interests of the great transportation business be considered.

Be It Further Resolved, That we respectfully urge upon such committees and our representatives in congress, that they recommend that Canadian grain be admitted free of duties, so that our transportation business may be increased to the benefit of the whole country, instead of permitting the great trade of transportation of grain to go by Canadian routes.

The package freighter Mohawk, of the Western Transit Co.'s fleet, which stranded near Detour, is in dry dock at Ecorse. Her bottom is badly damaged and about 80 plates will have to be taken off.

Mr. S. P. Shane, the new manager of the Gilchrist Transportation Co., met with the directors of the company last week. He will devote his entire time to the new position after Feb. 1.

Capt. Barney Townsend of the steamer Adriatic of the Lackawanna Steamship Co.'s fleet, will remain ashore to look after his private business. Capt. James N. Neal will sail the Adriatic next season.

PACIFIC COAST NOTES.

Office of the MARINE REVIEW,
302 Pioneer Bldg., Seattle, Wash., Jan. 9.
Rapid progress is being made by the Moran Co. in repairing the British ship Kynance and the work will be finished within seven days. The Kynance was damaged by dragging her anchors while moored at Bellingham Christmas afternoon. Bids were asked for the repairs and the Moran Co. submitted the lowest tender, agreeing to do the work for \$1,644 in seven days. The Commercial Boiler Works, Seattle, bid \$1,797 and offered to complete the contract in eight days. The specifications call for repairing the plates on the port bow, renewing about 60 ft. of bulwarks and rails, with all fittings; repairs to the starboard quarter and poop rails; furnishing a new working boat and equipment and removing and replacing any of the lumber cargo that may be in the way. In addition to these repairs the Kynance's gear will have to be renewed, as in the gale at Bellingham she lost her mooring lines, running gear and other equipment. Bids for this equipment will be received and awarded in a few days. The gear will cost more than the repairs. Capt. Auld, of the Kynance, it is understood, will take steps to hold the ship Jupiter which was lying near him at the time of the accident liable for the repairs. The matter will be fought out in the courts.

Cooke & Lake, ship builders, Ballard, Wash., have started work on two big scows and a steamer for the Susitna region, ordered by the Alaska Commercial Co. The builders expect to complete the scows and steamer within 90 days; they have erected big sheds under which to work, so bad weather will not hinder. The larger of the two scows will be built first and when it is finished the steamer, which is 110 ft. long, will be constructed on the scow and shipped to the north in this manner. The steamer and scows are for service on the Susitna river, Alaska.

The new \$600,000 Canadian Pacific liner Princess Charlotte has arrived on Puget Sound, 59 days from the Clyde. The new steamer will be overhauled and will enter service about Jan. 15.

The Anderson Steamboat Co. is constructing at its yards at Houghton, Wash., two new steamers for service on Lake Washington in connection with the A. Y. P. exposition at Seattle next summer. These boats will cost \$15,000 each. The boats will be sisters, each 90 ft. long, 17 ft. beam and 16 ft. deep. Each will accommodate 250 passengers and at least one will be done by May 1. The

boats are being constructed under the direction of Capt. J. L. Anderson and R. A. Stewart. The new craft are expected to have a speed of from 16 to 18 miles per hour.

As she was entering the dock at San Francisco Jan. 3, the lumber steamer Brunswick collided with the U. S. army transport Thomas and badly damaged some of the plates about the stern of the Thomas. The Brunswick was but little injured. The collision was due to a strong tide which swung the Brunswick against the Thomas as the latter lay at anchor off Folsohn street.

The steel steamship Chippewa was off her run between Seattle and Tacoma for two days last week on account of the giving away of a condenser tube Jan. 2.

The Kitsap County Transportation Co.'s fast steamer Kitsap, which was also running between Seattle and Tacoma met with an accident Dec. 31. Her propeller hit a sunken log and the tail shaft broke off just abaft of the stern bearing, dropping the propeller into the sea. The valve gear of the engine was stripped, the rudder damaged and the shoe bent. The Kitsap will be repaired by the Hefernan Engine Works, Seattle, and will be laid up for about 10 days.

The Alaska Pacific Steamship Co., which recently purchased the Atlantic coast steamer Admiral Sampson, announces that the new steamer will go into service between Seattle and California ports about March 15. When the vessel goes into commission the company will inaugurate a schedule with sailings every five days between Puget Sound and San Francisco and through service to Los Angeles via San Pedro, Cal., every 15 days. This is the first through service between Puget Sound and southern California ports. The Admiral Sampson will touch only at Seattle and Tacoma as her northern terminals.

The hull of the wrecked schooner Gotoma which is now lying near Grays Harbor, Wash., has been sold to Frank Peterson, of Westport, Wash., for \$120. The price includes the remainder of the cargo which was washed out of the hull and on to the beach. The vessel is broken in two and the stern is sunk deep into the sand.

The Independent Transportation Co. has filed suit against the China Traders Insurance Co. for \$4,230 to recover insurance on the steamer Vashon, which it is alleged became a total loss save

\$750 for which the boat was sold Aug. 3. The Vashon sunk at her moorings on Jan. 11, 1908. The libellants allege the value of the boat was \$15,000.

Customs officials have seized the Danish ship Jupiter on account of the non-payment of a fine of \$5,000 which was levied because the vessel appeared on Puget Sound from Liverpool without a consular bill of health. Capt. Funder, of the Jupiter, declares he could not get his papers when he sailed from England because the consul was out of town. The Jupiter has also been sued for the damages to the British ship Kynance in Bellingham, Dec. 25.

The steamer St. Croix, recently purchased by Schubach & Hamilton, of Seattle, from the Mutual Transit Co., Boston, has been fixed for an indefinite period by the Alaska Coast Co. In place of the steamer Bertha the St. Croix will be operated by the charterers on the run to Valdez and southwestern Alaska for at least two months. The St. Croix is billed to leave out for Valdez on the first voyage March 25.

The United States revenue cutter Thetis, Capt. A. J. Henderson, is in port to allow estimates to be made for routine repairs which will be made on her in the near future. These repairs include caulking the decks, cleaning, painting, shipping a new propeller and other general repairs. The report that the Thetis is in need of an extensive overhauling is denied. The Thetis will winter on Puget Sound.

Pacific coast and other ship building yards have a chance to compete for the construction of 25 or 30 steel barges for use in the far east. The address of the firm desiring these barges can be obtained at the bureau of manufactures, Washington, D. C. The barges must not be over 100 ft. long, 50 to 100 tons displacement, draught not to exceed 3½ ft. loaded and have power twin engines using kerosene oil for fuel, giving a guaranteed speed of from 1' to 16 knots. They must be built of steel, of the knockdown type.

Advices from Honolulu state that the Australian liner Moana, which left Vancouver, B. C., Dec. 4 for Sydney, experienced terrible weather on the way down but arrived at Honolulu safely and on time. The Moana ran into the same stormy weather which delayed the Empress of Japan and at one time Capt. Morrisby considered the jettisoning of part of the cargo. For two or three days the Moana had her seagoing qualities

thoroughly tested and during this time most of the steerage passengers wore life preservers continually, so constantly were their quarters flooded by the heavy seas.

The British ship *Kynance*, Capt. Auld, has arrived in Seattle where she will be placed on the ways for repairs made necessary by collision with the Danish ship *Jupiter*, Christmas day. While some of the plates are loosened below the water line it is not thought it will be necessary to unload her cargo of lumber in order to repair.

The two-masted schooner *Gotoma* lost her deckload of lumber in a recent gale off the Washington coast, sprung a leak and foundered. Her crew consisting of Capt. Gruggel, his wife, a mate, cook and four seamen were rescued just in the nick of time by the steamer *Santa Monica*. She belonged to the Simpson Lumber Co. and was insured. She is a wooden schooner built in 1872 at Coos Bay, Ore., by the Miami Lumber Co. Her tonnage is 199 gross, 189 net and she is 119 ft. long.

The British steamer *Advance* and the British bark *Iverna* collided off Newcastle, New South Wales, Dec. 28. The *Advance* went down and with the exception of her first officer, all the members of the crew lost their lives. The *Iverna* put into Newcastle leaking badly.

The steamer *Senator* while coming down the Columbia river the night of Dec. 25 collided with the warehouse of the Kelvenhusen Cold Storage Co. at Altoona about 11 p. m. The mishap was due to a failure of the Senator's steering gear to work properly. The wharf and front of the warehouse were carried away; the steamer was not badly injured. The damage is estimated at \$8,000.

United States Steamboat Inspectors Whitney and Turner at Seattle, announced recently that they have suspended for 90 days, commencing Dec. 23, the license of Mate William C. Ansell, who is held responsible for the grounding of the steamer *Northland* on Enterprise Reef, Nov. 27. Ansell is adjudged guilty of careless navigating. The *Northland* has been repaired by the Moran Co. at a cost of \$8,300 and has again resumed her run.

The two-masted schooner *San Buenaventura* was picked up by the tug *Columbia* and towed into port at Marshfield, Ore., Dec. 24, with her rigging and masts carried away as a result of

the storm of Dec. 24 and 25, which wrought havoc with shipping all along the Pacific coast. The schooner was enroute from San Francisco to Port North and was light. The *San Buenaventura* was a wooden schooner built in 1876, 180 tons gross, 171 net, 107 ft. long by 30 ft. beam, owned by W. J. Woodside, San Francisco.

Capt. Worth G. Ross, chief of the revenue cutter service, has informed Senator Piles that the life saving tug *Snohomish* now enroute to Puget Sound around Cape Horn, will spend the first few weeks after its arrival visiting such Snohomish county ports as may express a desire to see the vessel. These ports will include Everett and possibly Snohomish, if the depth of water in the Snohomish river will permit.

The American ship *Benj. F. Packard* which was recently sold to the Northwestern Fisheries Co., to carry salmon cases from Alaska was bought for \$25,000, which is considered a good price for wooden vessels as they are selling these days. But the *Packard* was in exceptionally good condition.

Naval officials are visiting Puget Sound looking for a suitable site for a torpedo station for the navy department.

John Mitchell, Seattle, was the lowest bidder for the extensive repairs contemplated for the Pacific Coast Steamship Co.'s steamer *Alki*. The next lowest tender was made by Hall Bros. Marine Ry. & Shipbuilding Co. The awards have not been made and the matter is being held in suspense by the steamship company.

James Griffiths, president of the Coastwise Steamship & Barge Co., of Seattle, recently purchased in San Francisco six wooden sailing ships. These will be dismantled and transformed into barges. For the next two years they will engage in freighting rock from Port Orchard, Puget Sound, to Grays Harbor, there to be used in the construction of the north jetty being built by the government. This purchase is the largest deal in sailing vessels in the Pacific coast for several years. The vessels sold to Mr. Griffiths are: Ship *St. David*, bark *St. David* and ship *James Drummond*, by the California Shipping Co.; bark *Big Bonanza* by the Golden Gate Shipping Co.; barks *Carondelet* and *Palmyra*, by the Puget Sound Commercial Co. The first four vessels are registered at San Francisco and their sale was negotiated by Rinder &

Mathews, ship brokers. The two latter barks are registered at Port Townsend. The deal amounts to from \$50,000 to \$75,000. The vessels will be brought to Puget Sound and thoroughly overhauled; the topmasts will be taken down and the hatches will be enlarged. The sale of these six ships for freighting purposes marks only another step toward the banishment of the American flag from the high seas for the vessels were all American built and once part of our fine fleet of merchantmen.

Hall Bros. Marine Railway & Shipbuilding Co. is overhauling the steamer *Monticello*, at the Eagle Harbor works. The *Monticello* is having a new tail shaft fitted and is also being painted throughout. The same company is re-rigging the three-masted barkentine *John Smith*, of San Francisco. The tug *Tacoma* has been hauled out at these yards and will undergo repairs in the future. John L. Hubbard, manager of the works, says that, financial conditions considered, the year now closing has been very successful for his company.

The Moran Co. has been awarded damages against the Chesley Towboat Co. for \$3,616.23 on account of damage to the plaintiff company's dry-dock by the steamer *Olympia* in tow of one of the Chesley Co.'s tugs.

The steamship *Dora* is enroute to Seattle from Seward, Alaska, to undergo annual repairs and overhauling. The *Dora* is expected to arrive on Puget Sound Dec. 21, and unless she requires more extensive repairs than are expected will only miss one trip on her run westward from Seward as far as Unalaska.

The Northwestern Fisheries Co., of Seattle, has purchased the American three-masted wooden ship *Benjamine F. Packard* from A. Sewall & Co., of Bath, Me. The *Packard* is now lying at Eagle Harbor. She will be used by the fish company to run to the Alaska canneries during the summer.

D. J. Dolson, of Omak, Wash., is assembling a light draught boat at Wenatchee, Wash., which will be ready for service on the river by Jan. 1. The boat is to run on the Okanogan river between Omak and Brewster, carrying passengers, express and freight, giving daily service between these points.

Officials and Masters of Pittsburg Steamship Co.

The first annual meeting of the officials and masters of the Pittsburg Steamship Co. was held at the Hollenden hotel, Cleveland, last week, opening on Wednesday and concluding with the usual dinner on Friday evening. These meetings are growing annually more important and are extremely valuable to the company. They have contributed much to the unity which is so distinguishing a characteristic of this fleet. The Pittsburg Steamship Co., notwithstanding its great size, is a more compact and more cohesive body than any other company on the lakes.

In his opening remarks, Mr. Harry Coulby, president and general manager, congratulated the masters upon the successful way in which they had navigated their vessels during the last season. He dealt at length upon the welfare plan recently promulgated by the Lake Carriers' Association and predicted that conditions would be better than they had ever been if the men themselves enter heartily into the spirit of the plan. Mr. Coulby's remarks in full upon this subject will be published later.

At the afternoon session Mr. Hermon A. Kelley, general counsel for the company, addressed the masters on "The Causes of Accidents and How to Avoid Them." He illustrated his subject by reference to specific collision cases and how they could have been avoided. In the general discussion which followed much time was devoted to the subject of navigating freighters in congested and narrow waters.

At the second day's session, Mr. Coulby announced the appointments for the season of 1909, which are published elsewhere. Mr. Robert Logan, general manager of the American Ship Building Co., addressed the masters on the subject of "Proper Distribution of Cargo on Board Modern Freighters." Mr. Logan in part said:

"During the past 15 years the size of lake vessels engaged in the ore or lumber freight trade has increased from some 3,000 tons to 13,000 tons carrying capacity, and from 300 to 600 feet in length, involving many new features in type and construction and making the question of the distribution of the load to be one of very great importance. This is particularly so in the longer class of vessels.

"The stresses producing strain on the hull resulting from the distribu-

tion of the load lengthwise of the vessel, are the most severe to which the vessel is subjected. I think it will be conceded generally that the best distribution of the cargo load, is the one that will cause the least amount of strain in the hull, when the vessel is afloat in still water, for all such initial strains in the hull are just so much added to the strains that necessarily take place when the vessel is under the action of the waves, consequently they ought to be avoided as much as possible.

"All modern lake vessels built to carry coarse freight in bulk with the machinery aft and accommodations forward have when loaded equally between those parts a natural tendency to sag or draw more water amidships than at the ends, due to the fact that there is an excess of buoyancy over weight at both bow and stern.

"About 36 per cent of the load should be located in the forward third of the cargo hold, about 30 per cent in the amidship third of the hold and about 34 per cent in the after third of the hold, and this distribution will be found to give the minimum amount of strain in the hull and at the same time give the vessel her proper sailing trim, three to six inches by the stern at the loading port.

"In the case of tow barges of the usual form the loading ought to be similar to that given for steamers, the heaviest weight at the two ends.

"When sailing light or without cargo another condition is met with and one entirely peculiar to lake vessels propelled by steam. When good weather prevails all that is aimed for under these circumstances is to get the propeller wheel under the water and if the weight of the machinery, boilers and fuel, all in the after end, are not sufficient for this enough water is run into the after tanks until the boat may be drawing 14 to 15 feet aft and nothing at all forward, giving a draught of 7 to 7½ feet amidships. In this condition the vessel is subjected to a hogging strain, having an upward pressure from buoyancy centered somewhat aft of amidships and a downward pressure at each end due to the weights there not being entirely supported by water. This condition is not very severe on the ship in calm weather, but in any kind of a sea the strains will be extremely severe and even dangerous.

"It may also be greatly aggravated by a wrong manipulation of the water ballast when it is desired to sink the bow. This ought to be always done by flooding the ballast compartments from aft to forward until the desired draught forward and aft has been obtained, and never by flooding the ends and leaving the midship compartments empty."

At the afternoon session Major Charles Kellar discussed the lake survey and the work of the lighthouse department.

The third day's session was devoted to the problem of loading and unloading. At the morning session the representatives of the loading docks met with the men. It was the consensus of opinion of the dock superintendents as well as the masters that there should be men on all the docks to handle lines. The policy was pursued at Two Harbors last year with the result that there was not a single damage case at that port. It makes the work of getting a steamer into dock much easier, as well as obviating the danger of sending a man over the side of the vessel. The plan will be suggested to the dock superintendents of other ports for adoption. Better dispatch and less shifting were also pronounced.

The dock superintendents at the receiving ports met with the captains at the afternoon session. It was suggested that better results might be obtained in some cases by working more shovelers in the holds of the bulk freighters. Changes in a number of ships that were built before the girder system became in vogue were also suggested and it was announced that the Pittsburg Steamship Co. intends to make alterations in 15 of its steamers to conform to the modern practice of unloading.

President Livingstone of the Lake Carriers' Association addressed the men during the afternoon session on the subject of Aids to Navigation. Mr. Livingstone especially inquired regarding the efficiency of the lighting system in the new West Neebish channel.

The sessions were concluded with the annual dinner at the Hollenden on Friday evening. Mr. James H. Hoyt acted as toastmaster and the speakers included Mr. Coulby, A. F. Harvey, Wm. Livingstone, H. H. McKeehan, Wm. A. McGonagle, J. H. McLean, D. Sullivan, H. G. Dalton, W. B. Lin-

sley, Major Charles Kellar, T. W. Rovinson and H. A. Kelley.

In the appointments it will be noted that Capt. Richard Jollie will bring out the new steamer E. J. Buffington and Capt. W. J. Hunt the Alva C. Dinkey. These two vessels are the new 600-footers now building at Lorain. The appointments follow, three mates having been promoted to masters' berths:

STEAMER.	MASTER.
Morgan	A. P. Chambers
Ream	A. C. Chapman
Rogers	James Leisk
Widener,	Fred Hoffman
Corey	F. A. Bailey
Frick	Neil Campbell
Gary	W. H. Moody
Perkins	F. J. Crowley
Cole	J. W. Morgan
Phipps	W. B. MacGregor
Lynch	E. M. Smith
Baker	George A. Bell
Edenborn	C. Gegenheimer
Ellwood	C. H. Cummings
Gates	James A. Walsh
Hill	A. J. Talbot
Poe	W. C. Iler
Morse	E. O. Whitney
Houghton	John F. Parke
Cornell	W. H. Kilby
Harvard	A. R. Robinson
Princeton	John Burns
Rensselaer	S. C. Allen
Malietoa	R. F. Humble
Bunsen	J. T. Gemmell
Van Hise	F. C. Watson
Murphy	George H. Bowen
Shaw	H. Culp
Mataafa	H. J. Regan
Mauna Loa	J. A. La Framhoise
Superior City	John R. Noble
Black	Andrew Hansen
McDougall	John Nahrstedt
Fairbairn	C. J. Grant
Fulton	C. G. Ennis
Bessemer	W. S. Hoag
Siemens	M. K. Chamberlain
Coralia	W. H. Campau
Stephenson	H. G. Harbottle
Watt	Arthur Montague
Crescent City	Frank Rice
Empire City	James Burr
Maricopa	C. A. Weitzman
Ericsson	T. J. Cullen
Linn	George H. Bunker
Queen City	A. C. Smith
Zenith City	C. D. Secord
Eads	George Randolph
Rockefeller	A. G. McLeod
Maritana	C. S. Boyce
Mariposa	George G. Burt
Gilbert	A. W. Burrows
Cort	W. P. McElroy
Neilson	George W. McCallum
Briton	George Holdridge
German	J. C. Bell
Roman	H. Walper
Saxon	George W. Ames
Corona	J. A. Ferguson
Corsica	W. E. Stover
Manola	S. E. Meeker
Mariska	A. R. Thompson
Maruba	Dan McGillivray
Matua	Thomas Wilson
Marina	W. E. Warner
Masaba	E. L. Sawyer
Palmer	
Wolvin	
Colgate	
Mather	
Trevor	
Cambrria	
Griffin	
Joliet	
La Salle	
Wawatam	
Buffington	
Dinkey	
BARGE.	
Smecaton	
Fritz	
Manila	
Marsala	
Roebling	
Bryn Mawr	
Maia	
Maida	

MASTER.
J. R. Parker
J. Y. Sprowell
Alfred Beaupre
James N. Ames
W. F. Cottrell
George B. Kendall
J. H. Dissette
Arnold Nordahl

Holley	Frank Hebner
Bell	C. Mulholland
Jenney	O. W. Holdridge
Nasmyth	W. H. Dick
Thomas	George J. Maloney
Carrington	H. M. Saveland
Corliss	George W. Balfour
Krupp	F. H. Rae
Manda	H. Harris Jr.
Martha	William McDonald
Magna	H. M. White
137	Robert Thompson
Malta	Charles Goron
Marcia	A. S. Hand

With the exception of a few of the smaller steamers, all the mates have also been lined up for the coming season.

DECEMBER LAKE LEVELS.

The United States Lake Survey reports the stages of the great lakes for the month of December, as follows:

Lakes—	Feet above tide water, New York.
Superior	602.01
Michigan-Huron	580.16
Erie	571.38
Ontario	245.49

Since last month, Lake Superior has fallen $2\frac{3}{4}$ in., Lakes Michigan and Huron have fallen $2\frac{1}{4}$ in., Lake Erie has fallen $3\frac{3}{4}$ in., and Lake Ontario $5\frac{1}{4}$ in.

During January, Lake Superior is likely to fall 4 in. and Lakes Michigan-Huron $1\frac{3}{4}$ in.; Lake Erie should rise $\frac{1}{4}$ in. and Lake Ontario $1\frac{1}{2}$ in.

Lake Superior is $8\frac{1}{2}$ inches lower than the average December stage of the past 10 years and about $6\frac{1}{4}$ in. lower than last year. It is $7\frac{1}{2}$ in. higher than in December, 1891, but $5\frac{1}{4}$ in. lower than in 1906 and $13\frac{1}{2}$ in. lower than in 1900.

Lakes Michigan and Huron show a stage $\frac{3}{4}$ -in. lower than the average December stage of the past 10 years and $5\frac{1}{2}$ in. lower than last year, but 21 in. higher than in 1895. In December, 1885, the water was $28\frac{3}{4}$ in. higher.

Lake Erie is $10\frac{1}{2}$ in. lower than in Dec. last year. It is 4 in. below the mean December stage of the past 10 years, but $6\frac{1}{4}$ in. higher than in 1895. It is $21\frac{1}{4}$ in. lower than in December, 1876, and $25\frac{3}{4}$ in. lower than in 1885.

Lake Ontario is 10 in. lower than in December last year, but $3\frac{1}{4}$ in. higher than the average December stage of the past 10 years. In 1861 it was $25\frac{1}{2}$ in. higher, and in 1885 21 in. higher than in 1908. In December, 1895, it was $24\frac{1}{4}$ in. lower.

A MONTH OF MEETINGS.

The present month is an important one to the lake trade as many organizations engaged in the trade will hold their annual meetings. The annual meeting of the Lake Carriers' Association occurs at Detroit on Jan. 20. A general meeting of vessel owners will be held at Detroit on Jan. 18, to formulate some plan of action

for the safe-guarding of navigation to the end that the present excessive insurance rate may be reduced. The annual meeting of the grand lodge, Ship Masters' Association, will be held at Washington, Jan. 26. The annual meeting of the Marine Engineers' Beneficial Association will be held at Washington, Jan. 15.

NEW ASSOCIATION FOR LAKE ENGINEERS.

The Marine Engineers' Beneficial Association took action this week in the case of engineers who signed individual contracts last spring for the season of 1908. They were all found guilty. Evan I. Jenkins, who was formerly the lake business manager of the Marine Engineers' Beneficial Association, was suspended indefinitely. Four were fined \$100 each, eight are to be publicly reprimanded and five privately reprimanded by the president of the lodge. No action was taken against those who have signed individual contracts for 1909 as yet. The association was, however, notified in advance by the engineers that if any of the men under charges were suspended or fined, they would withdraw as a body from the association. Accordingly the members are now sending in their resignations. About 20 had resigned by Thursday and other resignations are expected to follow fast, over 100 members having announced their intention to withdraw.

Coincident with this a movement has been started to form a new organization of marine engineers on the lakes. The men employed in the fleets of the Pittsburgh Steamship Co. and Pickands, Mather & Co., will form the nucleus of this new organization, but its membership will be extended as rapidly as possible to embrace all the fleets in the Lake Carriers' Association. A preliminary meeting to this end was held on Wednesday. The new association will be mutual and beneficial, extending both sick and death benefits to its members. It is the wish that the new organization be in good working order by the opening of navigation. Notices have been sent out requesting all engineers who are in favor of the new organization to communicate with A. L. Eggert, American House, Cleveland, who is the chairman of the organization committee.

The Detroit local of the Licensed Tugmen's Protective Association has elected the following officers: President, Capt. George C. Burns; vice president, W. D. Pritchard; financial secretary and treasurer, Burt D. West; recording secretary, Capt. Alex Ruelle; corresponding secretary, Capt. C. W. Woodgrift.

British Shipbuilding in 1908.

The returns from shipbuilding centers throughout the British Isles disclose a decline in the tonnage launched during 1908, which is unparalleled, and far beyond anything anticipated 12 months ago. The Clyde builders, who for the first time constructed upwards of 600,000 tons of ships in 1907, this year report a decrease bordering on 275,000 tons. The returns for the Wear are upwards of 200,000 tons down, the total for the whole of the 13 shipbuilding yards being less than the tonnage launched last year by Messrs. William Doxford & Sons alone. Then the Tyne, the Tees and the Hartlepool districts each record a diminution of something like 100,000 tons, and in a lesser degree the story of decreased output also refers to the Forth and the Humber districts. The Irish builders are practically alone in reporting an increase of over 2,000 tons, which is almost entirely due to the fact that Messrs. Harland & Wolff have placed in the water 106,528 tons against 74,115 tons last year, and have thus won the blue ribbon of British shipbuilding for the largest output, an honor which was gained in 1907 and also in the year 1905 by Messrs. William Doxford & Sons, who this year are not in the first six; while Messrs. Swan Hunter and Wigham Richardson, Ltd., of the Tyne district, are second with 61,580 tons. According to the returns received from the 13 shipbuilding districts in the United Kingdom, the total output for 1908 has reached 1,045,036 tons, as compared with 1,726,997 tons by the same builders last year, so that there is a decrease of 681,961 tons. Never previously has such a huge drop been recorded.

Of the ships launched, allusion need only be made to two or three vessels. First place may be given to the "Leviathan," the new Mersey docks and harbor board dredger, which now completed and ready for her trials is the largest suction dredge in the world, being capable of raising 10,000 tons in 50 minutes. Then there is the Otaki, which, launched by Messrs. William Denny & Bros., in August last for the New Zealand Shipping Co., Ltd., is the first steamer to be fitted with a combination of reciprocating engines and turbines; but since then, of course, the White Star liner, Laurentic, with a similar

type of engines and triple screws, has been launched. The performances of these two vessels will undoubtedly be watched with keen interest by shipowners the world over, because they will settle a very important point in regard to the future propulsion of steamers.

With regard to British shipping generally, the year 1908 will long be remembered as one of the most unremunerative to shipowners that can be remembered. At no time during the year has there been a profitable business showing for the shipowner; in fact, in the autumn, when the owners expected in a measure to recoup themselves for the usually dull preceding months, freights were even worse. The consequence has been that owners have decided in many instances to lay up their property, and it is estimated that at the present time there are more than a million tons of idle ships carrying the British registry.

As to the future, those who are best able to judge are of the opinion that after a year of such depression as has been experienced, the year 1909 will show a distinct improvement in the freight market. Indeed, the volume of the trade of the country has fallen to so great an extent that it is only natural to expect there will be a revival, so that owners are seriously thinking of taking advantage of the very low prices ruling at present to modernize the fleets and dispose of their obsolete tonnage. In fact, during the latter part of the year several important orders have been placed, and in the shipbuilding industry the prospects, in some districts at least are much brighter than they were.

During 1908 no sailing ships of any size calling for notice have been built, and this type of ship is rapidly disappearing from the British registry, by reason of the fact that steamers are encroaching more and more on their business. This review would not, of course, be complete without a brief reference to the important co-partnership scheme unfolded by Sir Christopher Furness, in October last, and under which all those engaged in the shipyards of Messrs. Furness, Withy & Co. have become shareholders and profit sharers in the works, for by a majority of ten to one the workmen accepted the proposal. In proof of his confidence in the co-partnership principle, Sir Chris-

topher Furness, the head of those works, has stated that the Middleton and Harbor yards of this firm are capable of turning out 24 ships a year, and at his own risk he has given orders for half that number, or six for each yard. Several of these are now under construction. In addition, he has also ordered two more from Messrs. William Gray & Co., so that the Teeside yards have now an amount of work in hand which contrasts strongly with the almost entire absence of it when the engineers' strike was brought to a close.

The following are the returns from the various shipbuilding centers in the United Kingdom:

THE TYNE.

	1908.	1907.
Ves.	Tons.	Tons.
Swan, Hunter, &c.	17	61,580
Armstrong, Whitworth	9	51,384
Northumberland Ship Building Co.	6	22,840
Wm. Dobson & Co.	10	17,164
Hawthorn, Leslie & Co.	4	12,810
Tyne Ship Building Co.	3	10,512
Readhead & Sons.	2	10,123
Palmer's Ship Building Co.	3	7,149
Blyth Ship Building Co.	3	6,725
Smith's Dock Co.	31	6,151
R. Stephenson & Co.	2	5,939
Wood, Skinner & Co.	8	4,832
J. T. Eltringham & Co.	6	1,154
Hepple & Co.	9	868
J. P. Rennoldson & Sons.	4	745
Total.	117	219,976
		336,922

THE CLYDE.

	1908.	1907.
Ves.	Tons.	Tons.
Russell & Co.	13	48,618
Barely, Curle & Co.	6	38,810
C. Connell & Co.	7	30,698
Wm. Denny & Bros.	4	20,875
Alex. Stephen & Sons.	4	19,904
D. and W. Henderson & Co.	6	17,805
Fairfield S. & E. Co.	3	17,520
Caird & Co.	2	16,723
Napier & Miller, Ltd.	4	16,211
John Brown & Co.	3	15,300
Wm. Beardmore & Co.	1	11,533
Wm. Hamilton & Co.	2	11,386
A. McMillan & Son.	5	9,715
Wm. Simons & Co.	31	7,933
Clyde S. & E. Co.	5	7,201
A. & J. Inglis, Ltd.	5	6,777
Lobnitz & Co.	20	6,663
Greenock & Grangemouth Co.	3	6,524
Ailsa Ship Building Co.	22	5,985
Fleming & Ferguson.	10	5,050
Mechan & Sons.	184	4,205
Scott's S. & E. Co.	2	4,171
Ferguson Bros.	9	3,086
Alley & McLellan.	25	2,930
Yarrow & Co.	13	2,811
Bow, M'Lachlan & Co.	24	2,370
D. J. Dunlop & Co.	1	2,300
Mackie & Thomson.	17	2,187
A. Rodger & Co.	2	1,891
John Fullerton & Co.	5	1,883
Scott & Sons.	11	1,629
Ardrossan Co.	14	1,517
Geo. Brown & Co.	3	978
Ritchie, Graham & Milne.	9	377
P. Macgregor & Sons.	10	315
Murdoch & Murray.	1	282
J. & J. Hay.	1	92
London & Glasgow Co.	5,580
Robert Duncan.	5,981
Campbelton Co.	2,483
Totals.	474	354,225
		617,809

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BELFAST.

	1908.	1907.
Ves.	Tons.	Tons.
Harland & Wolff, Ltd.	8	106,528
Workman, Clark & Co.	8	50,303
Dublin Dockyard Co.	4	1,574
Larne Ship Building Co.	2	221
Total	22	158,626
		138,542

As Messrs. Harland & Wolff have the distinction of having turned out the largest amount of British tonnage during 1908, it will be of interest to give the list of vessels they have launched. The are as under:

HARLAND & WOLFF, LTD., BELFAST.

Name and port—	Tons.	I.I.P.
Memphian, s.s. (Liverpool)	6,305	2,700
Rotterdam, t.s.s. (Rotterdam)	23,980	13,600
Mercian, s.s. (Liverpool)	6,305	2,800
Lapland, t.s.s. (Antwerp)	18,565	13,000
Leopoldville, t.s.s. (Antwerp)	6,351	4,340
Laurentic, trip.s.s. (Liverpool)	15,340	9,700
Minnewaska, t.s.s. (Belfast)	14,342	10,000
Megantic, t.s.s. (Liverpool)	15,340	9,700
Total	106,528	65,840

THE WEAR.

	1908.	1907.
Ves.	Tons.	Tons.
Wm. Doxford & Sons	5	20,271
J. L. Thompson & Sons	3	10,521
Short Bros.	6	10,054
Sir James Laing & Sons	2	9,754
Osbourne, Graham & Co.	4	7,299
John Blumer & Co.	2	6,309
Robt. Thompson & Sons	5	5,301
J. Priestman & Co.	2	3,899
Bartram & Sons	1	3,738
Sunderland Ship Building Co	3	3,296
Wm. Pickersgill & Sons	2	2,968
John Crown & Sons	4	2,640
S. P. Austin & Son	2	1,725
Totals	41	87,775
		295,432

*Including erections.

TEES AND HARTLEPOOLS.

	1908.	1907.
Ves.	Tons.	Tons.
Wm. Gray & Co.	7	27,188*
Sir R. Dixon & Co.	5	26,146
Irvine's Ship Building Co.	6	14,200
R. Craggs & Sons	3	12,870
Richardson, Duck & Co.	9	8,027
Craig, Taylor & Co.	2	6,010
Roper & Sons	2	5,005
W. Harker & Son	4	3,731
Totals	38	103,177
		206,623

*Including erections.

THE HUMBER.

	1908.	1907.
Ves.	Tons.	Tons.
Earle's Ship Building Co.	9	6,130
Cochrane & Sons	24	4,437
Goole Ship Building Co.	17	3,286
Cook, Welton & Gemmell	12	2,760
Thomas Dobson & Co.	7	1,316
Joseph Scarr & Son	6	1,280
Henry Scarr	8	1,055
W. H. Warren	3	268
Totals	86	20,532
		35,249

THE FORTH.

	1908.	1907.
Ves.	Tons.	Tons.
Grangemouth Yard	9	4,638
Scot of Kinghorn	3	2,514
Ramage & Ferguson	2	2,046
John Cran & Co.	2	336
Hawthorns & Co.	2	230
John Robertson (Innes)	4	100
S. & H. Morton	1	77
J. Weatherhead	2	68
Mackay Bros.	—	4,607
Totals	25	10,009
		20,591

THE MERSEY.

	1908.	1907.
Ves.	Tons.	Tons.
Cammell, Laird & Co.	36	19,142
Vickers, Sons & Maxim	3	21,487
W. J. Yarwood & Son	13	1,744
Latham Ship Building Co.	6	1,637
R. Williamson & Son	3	1,535
Dee Ship Building Co.	12	1,232
William Walker	2	984
T. Sunner & Sons	1	15
Garston Graving Dock & Co.	—	1,380
Totals	76	38,776
		18,413

THAMES AND DISTRICT.

	1908.	1907.
Ves.	Tons.	Tons.
G. Rennis & Co.	24	6,333
Pollock, Sons & Co.	42	3,121
John Chambers	20	1,362
Henry Reynolds	18	1,333
A. W. Robertson & Co.	9	1,000
Edwards & Co.	15	957
Forrest & Co.	18	838
Fellows & Co.	5	400
Crabtree & Co.	4	336
Yarwood & Co.	—	1,734
R. & H. Green	—	573
Thornycroft & Co.	—	500
Totals	155	15,680
		16,212

ENGLISH CHANNEL.

The transference of their shipbuilding from the Thames to the English Channel is reflected in the increased output by Messrs. J. I. Thornycroft & Co., while Messrs. J. S. White & Co. also record an increase, and it is satisfactory to note that this firm has in hand no fewer than seven vessels of 39,630 tons. The total tonnage launched by the four principal builders is in advance of the figures for 1907, although the number of craft is 39 as compared with 53.

	1908.	1907.
Ves.	Tons.	Tons.
Thornycroft & Co.	9	3,741
J. Samuel White & Co.	14	2,555
Philip & Son	10	535
Cox & Co.	6	466
Totals	39	7,297
		6,325

TAY AND DISTRICT.

	1908.	1907.
Ves.	Tons.	Tons.
Caledon Ship Building Co.	4	10,681
Gourlay Bros. & Co.	3	7,590
Dundee Ship Building Co.	11	4,776
Montrose Ship Building Co.	7	2,957
Totals	25	26,004
		17,672

DEE AND MORAY FIRTH.

	1908.	1907.
Ves.	Tons.	Tons.
Hall, Russell & Co.	11	2,310
John Duthie Torry Co.	15	2,004
A. Hall & Co.	10	1,362
John Duthie, Sons & Co.	—	900
Totals	36	5,676
		10,757

BRISTOL CHANNEL.

From Bristol Channel shipyards there were launched 60 vessels, etc., of 8,480 tons, as compared with 61, of 8,025 last year, an increase of 455 tons, notwithstanding that there have been no launches by the Cardiff Channel Dry Dock Co. and Messrs. F. J. Carver & Sons, Bridgwater. Of this total 8,424 tons were launched from the yard of Messrs. C. H. Walker & Co., Ltd., of Sudbrook.

NAVAL REORGANIZATION.

Another step has been taken toward the reorganization of the navy. Secretary Newberry has increased the board of construction and has also indicated that the bureau of steam engineering is to be consolidated with the bureau of equipment.

The board of construction, says the *Army and Navy Journal*, by the secretary's order has been increased by the appointment to that body of Rear Admiral T. C. McLean, now president of the board of inspection and survey; Capt. William W. Kimball, now member of the naval examining and retiring boards; Capt. Sidney A. Staunton, member of the general board, and Capt. Isaac S. K. Reeves, member of the board of inspection and survey; the former members of the board of construction are continued. These are Rear Admiral G. A. Converse, retired, president; Rear Admiral N. E. Mason, chief of the bureau of ordnance; Rear Admiral William S. Cowles, chief of the bureau of equipment, and Chief Constr. W. L. Capps, chief of the bureau of construction and repair. The additions to the board secure experts in various lines. Captain Kimball is specially known as an authority on torpedo ordnance; Captain Reeve is skilled in steam engineering; Rear Admiral McLean and Captain Staunton have had service in the bureaus of ordnance and equipment.

It is expected that Rear Admiral Converse will continue at the head of the board until it gets into good working order and then within a few months will be relieved. He has been on the retired list two years, which have been more or less stormy in naval official circles, and his health is such that it is placing a heavy burden upon him to require him to apply himself to the hard work incident to his position at the head of the most important board in the department. It is also not unlikely that Rear Admiral Cowles will retire from the board before very long, as the duties of his position require his entire attention. Preliminary to the reorganization of the board of construction, Secretary Newberry amended the navy regulations with the approval of the president so that the work of the board is not restricted to new work and it may undertake "such other work as the secretary of the navy may assign." It will be observed that the new appointments bring the three important boards on construction, inspection and survey and the general board in touch with each other by having officers

members from each of the latter on the board of construction.

Another change of interest has been the assignment of Capt. A. E. Culver, former aide to Mr. Newberry when he was assistant secretary, to duty as a member of the general board. This board, which now numbers seven members, will soon be increased to 15. It is understood that the officers to be selected for this duty will complete the representation of every bureau in the navy, including details from the bureau of medicine and surgery and from supplies and accounts, thus making the general board what Mr. Newberry some weeks ago promised it should be—a general staff for the navy. By asking the president not to name a new chief of the bureau of steam engineering to succeed Rear Admiral Barton, who has just been retired, Mr. Newberry has taken a significant step toward merging that bureau with some other—either equipment or construction and repair. The latter has seemed the more likely for some time and when legislation is asked of congress to authorize the change probably the two named will be consolidated as embracing lines of work more or less germane.

NEW STEAMER FOR PUGET SOUND.

The Puget Sound Navigation Co., Seattle, Wash., is asking bids for the construction of a triple-screw steel passenger steamer for daylight service on Puget Sound. The new vessel is to cost between \$200,000 and \$300,000 and must attain a speed of 20 knots, and is to be ready for delivery in July. She is to have a capacity for 1,500 passengers. The exact dimensions of the craft have not as yet been decided but it is unlikely that she will be more than 250 ft. in length.

A unique feature of the new vessel will be the installation of turbine engines, as there are at present but two vessels on the Pacific so equipped, they being the Tenyo Maru and the Chiyo Maru, of the Toyo Kisen Kaisha, operating between San Francisco and the Orient.

The Moran Co., of Seattle, and the Craig Ship Building Co., of Long Beach, Cal., are probable bidders for the work of constructing this steamer.

A movement has been started to organize a lodge of the Ship Masters' Association at Ogdensburg. Capt. James A. Walsh will submit the matter to the grand lodge at its meeting in Washington during the present month.

ATLANTIC COAST NOTES.

Office of the MARINE REVIEW,
Room 1005, No. 90 West St.,
New York City.

The new steel barge Buffalo, built by the New York Ship Building Co. for the Lehigh Valley railroad, left Philadelphia on Sunday for New York, in tow of the tug John Hughes. She is one of six which the New York Ship Building Co. is building for the railroad company and will be used in the Long Island Sound trade.

The French line steamer Bretagne arrived at New York on Sunday and reported passing, on Jan. 7, the wreck of a schooner named the Isabelle Alice. There was no sign of life on the schooner, which is believed to be a French fishing boat.

The schooner Warner Moore, which was towed into Norfolk recently in an abandoned and waterlogged condition, has been pumped out by tugs. She will be inspected by the underwriters and owners, who will determine what is to be done with the vessel and cargo.

Another struggle is believed to be near at hand between the larger lines in the North Atlantic service. The dispute between the North Atlantic conference and the Italian companies over the Mediterranean trade is still unsettled, and the temporary agreement ends on Jan. 21.

Captain Thomas Spink, of the British steamship Conway, which arrived at Norfolk recently, reports that while coming up the coast on Dec. 31 the vessel passed through a wide area of boiling water. Captain Dunn, of the British steamship Lord Dufferin, recently reported a similar occurrence on a different date.

The Norwegian steamship Bjorgvin, from Philadelphia for Hull, put into St. Michaels, Azores, last week, to replenish her bunkers.

Five members of the crew of the British schooner Annie, of Liverpool, N. S., which was swamped by a waterspout about 15 miles from Oak Ridge, Honduras, on Nov. 16, arrived at New York last week on the British bark Annie Smith, from Belize. The schooner was a total loss.

Peter F. Fraser, master of the steamship Bermudian, of the Quebec Steamship Co., was recently presented on behalf of the United States government with a gold watch for distin-

guished life-saving service at sea. Henry Heyliger, Joseph Drayton, Joseph Wallace, James Hendrickson and William H. Dewent, seamen of the Bermudian, were presented with gold medals. John Fiske Walsh, formerly second officer of the Bermudian, will also be presented with a gold watch. The Bermudian, on Feb. 2, 1908, when 260 miles northwest of Bermuda, came up with the Mary L. Newhall, a four-masted schooner of Bath, Me., in a dismasted and sinking condition. Captain Fraser stood by the wrecked vessel for 16 hours and in the face of extremely heavy weather succeeded in rescuing the crew.

The Clyde Steamship Co. this week begins a service of four sailings a week from Philadelphia to Norfolk, Portsmouth and Newport News.

The White Star line steamship Oceanic, which arrived at New York on Jan. 7 from Southampton, came in 24 hours late. She lost one of her propeller blades on Sunday evening.

The British steamship Avonmore, which was driven ashore near Lynn Haven Inlet, in lower Chesapeake Bay, during the storm of Dec. 22, was floated by the wrecking tug Coley last Thursday. The condition of the vessel is not known.

The British steamship Anglo-African, which went ashore on Smith's Island, off Cape Charles, in a dense fog on Jan. 5, has been abandoned and now lies heavily listed. She is believed to be badly damaged, but the wreckers believe there is a chance of saving the vessel.

The Royal Mail steamship Magdalena, which arrived at Colon on Monday, reported that the steamship Trent, of the same company, was aground on the reef outside of Cartagena, Colombia, and that part of her cargo had been thrown overboard. The United States tug Scully was immediately sent to her assistance. The Trent left New York on Dec. 26 for Southampton, via Jamaica and Central American ports.

Second Officer John Sorensen, of the British steamship Aral, which arrived at Philadelphia recently, had a narrow and singular escape from drowning on Dec. 21. The Aral was bound from Shields to Philadelphia in ballast, and left the former port on Dec. 16. She encountered extremely

heavy weather, and on Dec. 21, when the storm was at its height, a gigantic wave washed the second officer overboard. He had been given up for lost when another huge sea threw him back aboard the vessel. This is no new experience, but seldom has the victim been so long in the water. It is estimated that Mr. Sorensen was overboard nearly 10 minutes.

To secure the co-operation of the United States life saving service and those companies possessing life saving vessels equipped with wireless telegraph, is the object of a bill introduced recently by Representative Calder, of New York. It empowers the life saving service to co-operate with these companies and also to notify them of all wrecks which may occur on the Atlantic coast, but specifies that the United States government shall not be liable for any recompense which these companies may give in saving human life or insuring the safety of vessels.

The three-masted schooner Warner Moore and the four-masted schooner William J. Lermond were towed into Norfolk harbor last week by the United States government derelict destroyer Seneca and the revenue cutter Onondaga. The two schooners, representing, with their cargoes of lumber, a total value of \$60,000, were abandoned at sea after having been severely handled by heavy weather, and were both directly in the path of shipping. The Warner Moore was bound from Charleston to Providence, and was completely waterlogged when picked up. The Lermond was bound from Fernandina for Philadelphia when her crew were taken off by the Austrian steamship Columbia, bound from Philadelphia for Tampa.

The German steamship American arrived at New York on Friday and reported that during heavy weather encountered on Christmas day, Captain Marksclager had been thrown along the upper deck and suffered the fracture of two ribs. Part of the American's rail and some of her fittings were carried away by the violence of the waves.

The new freight and passenger steamer Texas, from Christiana, Norway, to Havana, put into Savannah, Ga., on Jan. 1 with fire in her hold. The fire was discovered the day previous when the Texas was 100 miles off Tybee Light, and Captain

Pederson at once changed his course for Savannah. The loss will be considerable. The Texas is of 5,500 tons and is on her maiden voyage. She was built in Bergen, Norway, and is owned by the Norway & Mexican Gulf Steamship Co. She carried 14 first-class passengers, who were transferred to the United States harbor cutter Tybee and taken to Savannah. The cargo is valued at \$100,000.

The naval collier Abarenda left Hampton Roads last week for Gibraltar, where she will meet the returning United States battleship fleet. She has, in addition to her cargo of coal, a quantity of presents from the relatives of the men of the fleet.

The steerage passenger rates have been raised by the Red Star, Holland-America, Hamburg-American and North German Lloyd steamship lines to New York \$7.50.

It is rumored that the express steamers of the Hamburg-American Line will desert Plymouth, England, in favor of Southampton as a port of call, the change to take place early in spring.

The coal-laden British steamship Dahomey, which ran ashore on Elbow Reef, Bahamas, and sprung a leak, has been floated and hurried to Nassau, New Providence Island, where she is beached. She was bound from Newport News for Vera Cruz.

The three-masted schooner Modoc, bound from Perth Amboy for Eastport, Me., was abandoned 75 miles off Cape Ann in a sinking condition. Captain Dudley and his crew, who were in an exhausted condition through food supplies giving out, were taken off the Modoc by the fishing schooner Rob Roy, which landed them at Boston. The schooner had lost all canvas and was leaking heavily.

The fleet of lightships and light-house tenders bound from Camden, via Tompkinsville, for the Pacific, left Callao, Peru, on Dec. 27 for its destination.

The derelict destroyer Seneca reports having destroyed a sunken wreck on Friday off Assateague, Virginia coast.

Captain Charles E. Watts, of Watertown, Mass., master of the schooner Frank B. Witherbee, was lost at sea

while bound from Charleston, S. C., for Boston. The report of the accident was brought to Philadelphia by the Norwegian steamship Unique, from Santiago de Cuba, which spoke the Witherbee on Sunday, 50 miles south of Cape Henry.

The Philadelphia tug Clara, while tied up for the night at her wharf, sank in the dock and is completely submerged at high water. The accident is attributed to the tug catching on the side of the wharf and the rising tide filling her hold. Two members of her crew narrowly escaped death by the accident.

The wrecks of the Finance, which was sunk on Thanksgiving day by the Georgie, and the Daghestan, sunk by the Catalone just outside the entrance to the Gedney channel, on Dec. 18, have been abandoned by the wrecking company.

The British steamship Oriflamme, which was towed into Halifax, N. S., with her propeller and tail shaft missing, and was afterward towed to New York, has completed repairs and sailed for Rouen.

Several of the large trans-Atlantic liners arrived at New York at the close of last week from one to two days overdue. Considerable heavy weather had been encountered, reducing the speed of the big vessels.

ARRIVALS AT PHILADELPHIA.

During 1908, 5,932 vessels arrived at the port of Philadelphia. No correct list of arrivals of vessels was ever kept at this port before the board of commissioners of navigation was established. The arrivals were divided as follows:

Steamers from foreign ports (regular lines)	254
Steamers from foreign ports (fruiters)	191
Steamers from foreign ports (tankers)	236
Steamers from foreign ports (transient)	561
Steamers from coastwise ports (regular lines)	707
Steamers from coastwise ports (regular lines) via canal	379
Steamers from coastwise ports (tankers)	90
Steamers from coastwise ports (transient)	85
Steamers from coastwise ports (transient) via canal	56
Ships from foreign ports	3
Ships from coastwise ports	4
Barks and barkentines from foreign ports	40
Barks and barkentines from coastwise ports	16
Brigs and brigantines from foreign ports	0
Brigs and brigantines from coastwise ports	0
Schooners from foreign ports	94
Schooners from coastwise ports	647
Schooners from coastwise ports, via canal	151
Barges from foreign ports	2
Barges from coastwise ports	1,754
Barges from coastwise ports, via canal	602
Total	5,932

LAUNCH OF WHITE STAR LINER "MEGANTIC."

On Thursday, Dec. 10, the fine twin screw steamer "Megantic" was launched by Messrs. Harland & Wolff Ltd., Belfast. The new vessel is a

"light as air but strong as iron," bind the colonies to the mother country.

The "Megantic" and "Laurentic" will be the largest vessels in the Canadian trade, being 565 ft. long by 67

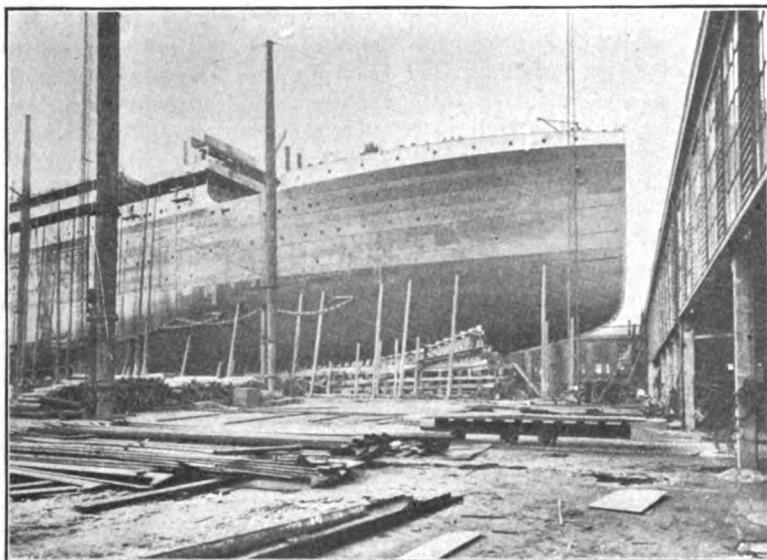
feet, 4 in. beam, and about 15,000 tons gross. They are designed to carry a large quantity of cargo, also a full complement of passengers—about 250 first class, 430 second class and over 1,000 third class.

The arrangements for cargo are of the most approved kind. There are six cargo holds, and the bunkers are specially arranged to facilitate the coaling.

Those who witnessed the launch were much struck with the handsome lines of the vessel, and when complete the "Megantic" will have a very fine appearance.

The derricks and other appliances for working the ship and cargo are of the latest pattern, special attention being paid in the design of the vessel to the requirements of shippers in the Canadian trade, and the vessel will have large refrigerated chambers both for provisions and cargo.

The passenger accommodation in the new vessel has been carefully arranged on the most generous principle, and it is confidently expected that



THE MEGANTIC ON THE WAYS.

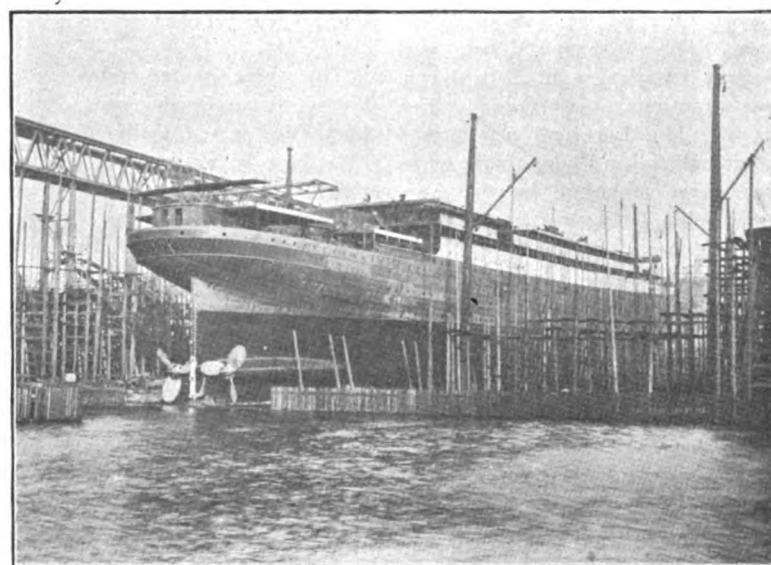
sister ship to the "Laurentic," which was launched last September, and which, it is expected, will be completed early next year.

Although a similar ship to the "Laurentic" in every other respect, the "Megantic" is a twin screw, whereas the "Laurentic" is a triple screw steamer, consequently these vessels, although exactly similar in their appointments, will each represent a distinct principle in marine propulsion. The "Megantic" will stand for the highest perfection of the twin screw "balanced" reciprocating engine, while in the "Laurentic" the combination of reciprocating engines and low pressure turbines has been introduced.

Special interest is being manifested in these two vessels as they will signalize the entry of the White Star line into the Canadian trade, a development to which those interested in the trade between the mother country and the dominion are eagerly looking forward, anticipating that the successful achievements of this well-known company in the New York and other important trades will be repeated on the St. Lawrence route. Probably in no part of the empire is there greater industrial and commercial enterprise at present than in Canada, and the new connection so soon to be inaugurated by the White Star line is bound to give a great stimulus to the spirit of enterprise, thus tending to still further strengthen those ties which,

ft., 4 in. beam, and about 15,000 tons gross. They are designed to carry a large quantity of cargo, also a full complement of passengers—about 250 first class, 430 second class and over 1,000 third class.

Needless to say the "Megantic" will



THE MEGANTIC TAKING THE WATER.

be, like all other vessels of the White Star line, designed and built on the most approved principles, nothing that long experience and practical knowledge can suggest being wanted to make her as perfect as possible in construction, arrangement and ap-

pointments. She has been built on the cellular double bottom principle, the double bottom extending the whole length of the ship, and specially strengthened under the engines to give still greater rigidity in the vicinity of the machinery. The vessel has nine watertight bulkheads, dividing her into ten watertight compartments. As of course is well known, the double bottom in addition to being an element of strength and security, provides space for water ballast, which is also carried in the fore and after peaks.

The arrangements for cargo are of the most approved kind. There are six cargo holds, and the bunkers are specially arranged to facilitate the coaling.

Those who witnessed the launch were much struck with the handsome lines of the vessel, and when complete the "Megantic" will have a very fine appearance.

The derricks and other appliances for working the ship and cargo are of the latest pattern, special attention being paid in the design of the vessel to the requirements of shippers in the Canadian trade, and the vessel will have large refrigerated chambers both for provisions and cargo.

The passenger accommodation in the new vessel has been carefully arranged on the most generous principle, and it is confidently expected that

and general roominess, and the staterooms will have the same characteristic. The decorations will also be of a truly artistic character, realizing the ideal of the artist—richness and simplicity combined.

The first class staterooms will be situated in a deckhouse on the lower promenade deck, and also on the shelter deck. There will be a number of cabins en suite, with private lavatory and bathroom adjoining each suite. The first class saloon on the middle deck will be a very handsome room, panelled and framed, finished flat white, relieved with elaborate carving. The dado and furniture will be in oak, and the floor parquetry. The saloon extends the whole width of the vessel and will have seating capacity for 160. It will have the popular "well" arrangement overhead, with veranda for the bandstand.

The first class lounge on the upper promenade deck will be in Louis XV style, artistically panelled in oak; parquetry floor.

The reading room on the same deck will be in white; in the style after Adam Bros. This will also have a parquetry floor.

The first class smokeroom on the upper promenade deck will be decorated with embossed leather and handsomely carved framework around the windows. The furniture will be of mahogany, and the floor India rubber tiles.

There is an electric passenger elevator serving four decks.

The second class staterooms are on the shelter deck; the saloon on the middle deck—a very fine apartment extending the whole width of the ship and to seat 262. The second class library is on the lower promenade deck, and the smokeroom on the upper promenade deck—both elegant apartments, tastefully decorated in polished hardwood. The second class passengers on this vessel will find the provision made for their comfort second to none on the Atlantic.

The third class dining room, which is aft on the upper deck, is also an exceptionally good room, extending the whole width of the ship.

The promenading spaces on this vessel will form a special attraction, the fullest advantage being taken of the vessel's size to provide the pleasurable recreation so much enjoyed by Atlantic voyagers.

The vessel will be fitted up with the latest and most improved Marconi system of wireless telegraphy, and will also have a submarine signalling apparatus.

SUMMARY OF NAVAL CONSTRUCTION.

The monthly summary of naval construction, issued by the bureau of construction and repair, shows the following progress upon vessels:

Name of Vessel.	Building at—	—1908—	
		Per Cent of Completion. Dec. 1.	Per Cent of Completion. Jan. 1.
BATTLESHIPS.			
South Carolina.....	Wm. Cramp & Sons.....	69.9	75.1
Michigan.....	New York S. B. Co.....	79.4	85.1
Delaware.....	Newport News S. B. Co.....	54.9	59.0
North Dakota.....	Fore River S. B. Co.....	62.8	67.4
Florida.....	Navy Yard, New York.....	....	....
Utah.....	New York S. B. Co.....	....	....
TORPEDO BOAT DESTROYERS.			
Smith.....	Wm. Cramp & Sons.....	59.9	62.8
Lamson.....	Wm. Cramp & Sons.....	58.5	61.8
Preston.....	New York S. B. Co.....	54.9	57.9
Flusser.....	Bath Iron Works.....	40.9	50.0
Reid.....	Bath Iron Works.....	38.5	48.5
Paulding.....	Bath Iron Works.....	....	3.0
Drayton.....	Bath Iron Works.....	....	3.0
Roe.....	Newport News S. B. Co.....	....	4.6
Terry.....	Newport News S. B. Co.....	....	4.8
Perkins.....	Fore River S. B. Co.....	....	3.8
Sterrett.....	Fore River S. B. Co.....	....	3.8
McCall.....	New York S. B. Co.....	....	3.4
Burrows.....	New York S. B. Co.....	....	3.3
Warrington.....	Wm. Cramp & Sons.....	....	(No report)
Mayrant.....	Wm. Cramp & Sons.....	....	" "
SUBMARINE TORPEDO BOATS.			
Stingray.....	Fore River S. B. Co.....	64.5	68.0
Tarpon.....	Fore River S. B. Co.....	63.0	66.9
Bonita.....	Fore River S. B. Co.....	60.8	63.0
Snapper.....	Fore River S. B. Co.....	58.2	62.3
Norwhal.....	Fore River S. B. Co.....	54.8	58.7
Grayling.....	Fore River S. B. Co.....	53.5	57.4
Salmon.....	Fore River S. B. Co.....	52.8	54.9
COLLIERS.			
Vestal.....	Navy Yard, New York.....	98.4	98.5
Prometheus.....	Navy Yard, Mare Island.....	94.0	98.5
TUG BOATS.			
Patapsco.....	Navy Yard, Portsmouth.....	86.0	90.0
Patuxent.....	Navy Yard, Norfolk.....	96.0	97.0

AUXILIARY STEAM POWER FOR SAILING SHIPS.

The Rickmers Co. is constructing another vessel of the type of the R. C. Rickmers, now disengaged at San Francisco. The feature of the R. C. Rickmers, and of the new vessel being built, is that she is supplied with auxiliary steam power to propel the ship when there is no wind and in inland waters, thus saving much time and towage bills. The decision of the owners to build another vessel along the lines of the original auxiliary sailer, which has now been afloat a little more than two years, indicates the success of the innovation from an economic standpoint. But there is considerable dispute as to the advisability of steam being used for the auxiliary power, in view of the advances being made by builders of producer gas and crude oil motors.

The record of the R. C. Rickmers with her steam and sail rig is interesting. In 608 days the vessel has logged 100,310 miles. The ship's 10 passages have been: Bremen to New York, New York to Saigon, Saigon to Bangkok, Bangkok to Bremen, Hamburg to San Pedro, San Pedro to Sydney,

Sydney to San Francisco, San Francisco to Tacoma, Tacoma to Antwerp, Antwerp to San Francisco. This is a record of 165 miles a day, or about seven miles an hour, averaging the running time of the 10 voyages. This is an unusual record. In this time the vessel has earned 945,462 marks or \$235,000. This is equal to about \$250 a day for the 942 days she has been either at sea or in port. This is equal to \$2.30 earnings per mile. In the 31 months the R. C. Rickers carried 42,000 tons of cargo, dead weight.

New York representatives of the Cunard line have denied the rumors which had been circulating to the effect that the liners Mauretania, Lusitania, Lusitania and Campania were to inaugurate a service to the British channel ports of Plymouth and Cherbourg, instead of going to Liverpool and Queenstown. One reason for this is said to be the fact that the Cunard Co.'s agreement with the British admiralty and the contract with the postmaster general in London call for the taking on of the American mails at Queenstown, making such a change as mentioned improbable while these provisions continue.

Winter Moorings of Lake Vessels.

ALPENA, MICH.

Str. Carter, W. J. Str. Hall, S. C.
Tug Clara Belle Tug Ralph
Bge. Flint, Sam Str. Viking

ASHLAND, WIS.

Tug Ashland Str. Hilton
Str. Brower, A. G. Str. Reed, James H.

ASHTABULA, O.

Str. Ames, Ward Str. Polynesia
Str. Flagg, G. A. Str. Stackhouse, Powell
Str. Kerr, D. G. Str. Thompson, A. W.
Str. Leonard, Geo. B. Str. Van Hise
Str. Murphy, Simon J. Str. Warner, R. S.
Str. Neilson, J. B. Str. Warriner, S. D.
Str. Nye, Harold B. Sch. Warriner, S. D.

BAY CITY, MICH.

Bge. Dayton Str. Orinoco
Str. Donaldson, J. P. Str. Woodford, W. R.
Bge. Jenness, B. W. Bge. Wright, A. W.

BELLEVILLE, ONT.

Sch. Keewatin

BENTON HARBOR, MICH.

Str. City of Benton Str. Holland
Harbor Str. Puritan
Str. City of Chicago

BLACK ROCK, N. Y.

Bge. Aloha Str. Mohegan
Bge. Francombe, J. A.

BOUCHERVILLE, CAN.

Str. Longueuil

BOWMANVILLE, ONT.

Sch. Mowat, Oliver Str. Marshall, Samuel

BROCKVILLE, ONT.

BUFFALO, N. Y.

Str. America Str. Mills, Robert
Str. Americana Str. Milwaukee
Str. Andrews, Mat. Str. Minch, Anna C.
Str. thew Str. Minneapolis
Str. Auburn Str. Mitchell, John
Str. Aurania Str. Morrow, Joe S.
Str. Barlum, Thos. Str. Munro, Josiah G.
Str. Bethlehem Str. Nettleton, A. E.
Str. Binghamton Str. Niagara
Str. Boland, John J. Str. Northern King
Str. Bope, H. P. Str. Northern Light
Str. Boston Str. North Land
Str. Brazil Str. Northern Wave
Str. Brown, J. J. II. Str. North West
Str. Buffalo Str. North Wind
Str. Buffalo Str. Nottingham, William
Str. Butler, Jos. G., Jr. Str. Notttingham, William
Str. Carter, E. D. Str. Nyanza
Str. Chemung Str. Owego
Str. Chicago Str. Parks, Sheldon
Str. Clarion Str. Peavey, Frank H.
Str. Colonel Str. Penobscot
Str. Columbia Str. Pine Lake
Str. Commodore Str. Rappahannock
Str. Commodore Str. Redington, Nellie
Str. Cornelius, Adam E. Str. Redington, Nellie
Str. Corrigan, James Str. Rhodes, William
Str. Cowle, John B. Str. Castle
Str. Craig, George L. Str. Rome
Str. Crerar, John Str. St. Paul
Str. Culligan Str. Scranton, Walter
Str. Dalton, H. G. Str. Smith, B. Lyman
Str. De Graff, Le- Str. Smith, L. C.
Str. Duluth Str. Steinbrenner, Henry
Str. Durston, J. F. Str. Superior
Str. Gobie Str. Susquehanna
Str. Gould, George J. Str. Thompson, Smith
Str. Hanna, D. R. Str. Tioga
Str. Honduras Str. Tionesta
Str. Hoyt, James II. Str. Truestal, W. H.
Str. Hubbard, Charles Str. Tuscarora
Str. Huron Str. Utica
Str. Ionia Str. Wallace, E. L.
Str. Iron King Str. Wallace, James C.
Bge. Iron Queen Str. Weston, Charles
Str. Italia Str. Wilkesbarre
Str. Japan Str. Wilson, Capt. Thomas
Str. Jenks, J. M. Str. Winnipeg
Str. Kerr, William B. Str. Wissahickon
Str. Kopp, Jacob T. Str. Wolvin, Augustus B.
Str. Lackawanna Str. Wyoming
Str. Luzon Str. Yale
Str. Mack, William Henry Str. Yonkers

BYNG INLET, ONT.

Bge. Mingoe Bge. Wilson, Annabell

CHEBOYGAN, MICH.

Str. Islander Str. Elva
Str. Columbia

CHICAGO, ILL.

Str. Adramled Sch. Matanzas
Str. Admiral Sch. Merrill, Julia B.
Str. Amazonas Str. Mitchell, Samuel
Str. Baker, George F. Str. Montezuma
Str. Barth, L. L. Str. Morgan, J. P.
Str. Brown, Fayette Str. Morley, W. B.
Str. Butcher Boy Str. Mott, Richard
Str. Cambria Str. Mueller
Str. Chicago Str. Niko
Str. Chieftain Bge. Norris, Alice B.
Str. Chili Str. Orr, George N.
Str. Christie, T. S. Str. Oscoda
Bge. City of Chicago Str. Pahlow, Louis
Str. Cole, Thomas F. Str. Paisley
Bge. Connelly Bros. Str. Panther
Str. Corey, William E. Str. Parent, S. N.
Str. Corsica Str. Peterson, Annie M.
Str. Crescent City Str. Phenix
Str. Davidson, A. D. Str. Phipps, Henry
Str. Edenborn, Wil- Str. Prentice, J. H.
liam Str. Queen City
Str. Ellwood, Isaac L. Str. Ralph, P. J.
Str. Empire City Str. Recam, Norman B.
Bge. Filer, D. L. Str. Rend, W. P.
Str. Fryer, R. L. Str. Sawyer, Philetus
Sch. Grampian Str. Seneca
Sch. Granada Str. Shenandoah
Bge. Halsted Str. Superior City
Bge. Harold Str. Syracuse
Bge. Helvetica Str. Tilden, S. J.
Str. Hines, L. E. Str. Troy
Str. Howe, George C. Str. Vail, Walter
Str. Kalkaska Str. Wade, J. H.
Str. Lambert, John Str. Wawatam
Str. Linn Str. Widener, P. A. B.
Str. Lynch, Thomas Str. Wiche, Trude R.
Str. Major Str. Zenith City

CLEVELAND, O.

Bge. Adriatic Str. Hutchinson, J. T.
Bge. Allegheny Bge. Jones, C. B.
Str. Andaste Str. Leuty, D.
Sch. Anderson, Alex Str. McDougall, Alex
Str. Argo Str. McGean, John A.
Str. Arizona Str. McGregor, Mary
Bge. Bottsford, R. Str. Mack, William S.
Str. Brown, Harvey II. Str. Maitland, A.
Str. Cadillac Str. Marina
Str. Caledonia Str. Maritana
Str. Carnegie, Andrew Str. Mather, Samuel
Str. Castalia Str. Centurion Str. Mattoa
Sch. Chattanooga Str. Mills, David D.
Str. Chisholm, A. S., Str. Moran, David
Jr. Str. Oliver, Henry W.
Str. Choctaw Bge. Owen, G. B.
Str. City of Buffalo Str. Paine, William A.
Str. City of Erie Str. Palmer, W. P.
Bge. Constitution Str. Pioneer
Str. Cornell Str. Pontiac
Sch. Crete Str. Presque Isle
Bge. Cutler, D. G. Str. Plymouth
Str. Eastland Str. Ranney, R. P.
Str. Ericsson, John Str. Rhoda, Emily P.
Str. Fairbairn, Sir Str. Rockefeller, Frank
William Str. Roman
Str. Falcon Str. Roumania
Str. Fitch, W. F. Str. Sachem
Str. Frontenac Str. Fulton, Robert
Str. Gates, J. W. Str. Shores, E. A., Jr.
Str. Gayley, James Str. Thomas, Sidney G.
Str. Gratwick, Wil- Str. Wallace, Robert
liam H. Str. Hanna, L. C. Str. Walsh, James P.
Str. Hanna, Doug- Str. Houghton, Doug-
las Str. Wolvin, A. B.

COBURG, ONT.

Str. City of New York Sch. Kitchen, J. B.

COLLINGWOOD, ONT.

Str. Ames, A. E. Str. Majestic
Str. Canadian Str. Mcleford
Str. City of Midland Str. Neboing
Str. City of Windsor Str. Ottawa
Str. Doric Str. Regina
Str. Germanic Str. Soo City
Str. Ionic

CONNEAUT, O.

Str. Bessemer, Sir Str. M. & B. No. 1
Henry Str. M. & B. No. 2
Str. Eads, James B. Str. Masaba
Str. Harvard Str. Poe, Gen. O. M.
Str. Hill, J. J. Str. Shaw, Howard L.
Str. La Salle

CORNWALL, ONT.

Str. Britannic Str. Filgate
Str. Emerald

DEPERE, WIS.

Bge. Teutonia Bge. Gawn, Thomas
PENETANGUISHENE, ONT.

Str. Chamberlain, C. Str. Wahnapitae
W.

DEPOT HARBOR, ONT.

Str. Orr, Arthur

DESERONTO, ONT.

Str. Armenia Str. Where Now

DETROIT, MICH.

Str. Arnedell Str. Harlow
Bge. Aurora Str. Huron
Str. Bielman, C. F. Str. Idlewild
Jr. Str. Jones, B. F.
Str. Carbray, Felix Str. Kirby, Frank E.
Str. City of Alpena Str. Kirby, S. R.
Str. City of Berlin Str. Kongo
Str. City of Cleve- Str. McWilliams, Ed.
land Str. Mohawk
Str. City of Detroit Str. Otis, John
Str. City of Mack- Str. Owana
inac Str. Quayle, Thomas
Str. City of St. Ig- Str. Rochester
nace Str. Stafford, W. R.
Str. City of the Str. Starke, C. H.
Straits Str. State of New
Str. City of Toledo York
Str. Desmond Str. State of Ohio
Str. Eastern States Str. Tashmoo
Sch. Gehhart, A. Str. Thew, W. P.
Str. Gettysburg Str. Western States
Str. Greyhound

DULUTH, MINN.

Str. Albright, John J. Str. Northern Queen
Str. America Str. Ohl, Edw. N.
Str. Caldera Str. Peavey, George
Str. Curry, S. S. W.
Str. Easton Str. Pollock, W. G.
Str. England, R. W. Str. Reis, William E.
Str. Grammer, G. J. Str. Reynolds, S. C.
Str. Hanna, Howard Str. Rhodes, J. W.
M., Jr. Str. Sacramento
Str. Hanna, M. A. Str. Sellwood, Joseph
Str. Hebard, Charles Str. Smith, Henry B.
S. Str. Stearn, Abraham
Str. Heffelfinger, Frank T. Str. Thompson, Alexis
Str. Milinokett W.
Str. Moore, C. W. Str. White, Dennis
Str. Wisconsin

ECORSE, MICH.

Str. Adriatic Str. Rogers, William
Str. Bradley, M. A. A.
Str. Crete

ERIE, PA.

Str. Alaska Bge. Marcia
Str. Alcona Bge. Marengo
Str. Armour, P. D. Str. Mariposa
Str. Bell, Sir I. L. Str. Mariska
Bge. Bryn Mawr Bge. Marsala
Str. Business Bge. Martha
Str. Carrington Str. Morse S. F. B.
Str. Codorus Str. Muncie
Str. Coralia Bge. Nasmyth, James
Bge. Corliss, George H. Bge. 117.
Str. Delaware Bge. 118.
Str. Egan, Wiley M. Bge. 130.
Str. Fitzgerald, R. P. Bge. 132.
Bge. Fritz, John Bge. 133.
Str. Griffin Bge. 134.
Str. Havana Bge. 137.
Bge. Holley, Alex Str. Pickands, H. S.
Bge. Jenney, William Str. Princeton
Le B. Str. Rensselaer
Str. Juniata Str. Ridle, J. Q.
Bge. Kelley Str. Salt Lake City
Bge. Krupp, Alfred Str. Schuykill
Str. Lehigh Bge. Maia
Bge. Magna Bge. Malta
Bge. Maia Bge. Manda
Bge. Maia Bge. Manila

ESCANABA, MICH.

Str. Livingstone, William (small)

FAIRPORT, O.

Str. Gary, E. H. Str. German

FERRYSBURG, MICH.

Str. Nessen, N. J.

FORT WILLIAM, ONT.

Str. Acadian Str. Minch, Philip
 Str. Bartow, J. H. Str. Shaughnessy, Sir
 Str. Cuddy, Loftus Thomas
 Str. Jenkins, Charles Str. Tampa
 O. Str. Wells, Frederick
 Str. Kensington B.
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NEW TRANS-PACIFIC LINE.

Officials of the Western Pacific railroad recently made efforts to prevent a premature announcement of their plans for a trans-Pacific line of steamships, but it is known that such negotiations have been in progress and reliable information indicates that an agreement has been reached whereby the North German Lloyd Steamship Co. will maintain a service between San Francisco and the Orient in connection with the Western Pacific railroad.

What tends to confirm all this is the undisputed fact that more dock room on the San Francisco water front has been negotiated for and plans drawn for new piers. When these negotiations were first a matter of rumor it caused some surprise and doubt as it was assumed that if previous statements of a recent agreement between Harriman and Gould were true, as precedent of financial assistance given to the latter, it would seem to preclude an independent move of such far reaching importance as the establishment of a rival steamship service on the Pacific. Taking it for granted that this is to be done, it is hardly likely that arrangements would be made for that purpose with the International Mercantile Marine, as it has had no connections in China, while the North German Lloyd line has a line through the Suez canal and to the Straits settlement, with a well established business.

It appears to be well settled that the North German Lloyd has been making preliminary preparations to place a line of its steamships in operation from European ports to San Francisco on the opening of the Panama canal. With the line from there

to the Orient, in conjunction with the Western Pacific freight traffic, the German company would be in a particularly strong position with a complete service circling the globe.

A similar connection is to be made in the north, according to the recent announcement that on the completion of the Grand Trunk to the Pacific coast the Cunard line will establish steamers from the western terminal of the road to China ports.

Another matter of significance in connection with the Western Pacific story, that tends to show the deal to have been made with the North German Lloyd and not the Hamburg-American, is the fact that last January these two companies entered into an agreement, under which the Hamburg-American Co. withdrew from the passenger service to the far East in conjunction with the Suez service, and both companies agreed to work in unison on all the important lines of their service.

DIFFICULTIES IN THE NAVY DEPARTMENT.

Considerable feeling has lately been engendered between the bureau of construction and repair and the naval civil engineering corps of the navy department as a result of an investigation of the leak in dry dock No. 2 at the New York navy yard. The dock is built on made ground and a bad leak had been giving trouble for several months and had not been located. Civil Engineer Leonard M. Cox, of the naval engineering corps, who is admittedly the highest authority in this country on everything pertaining to decks, had been detailed to examine the dock and had located the leak by means of aniline dyes, sending a long report to Rear Admiral Holliday, chief of the bureau of yards and docks. Subsequently a commission of three, consisting of Naval Constructor Stocker as president, Civil Engineer Gregory, chief of the yards and docks division of the New York navy yard, and Engineer Cox, was detailed to make an investigation. As Engineer Cox had already done this his friends felt that an injustice was being done in asking him to serve in a subordinate capacity on the commission, in view of his recognized capabilities. An additional ground for grievance is found in the fact that the report sent to Washington by the commission is in all essentials the same as the earlier one of Engineer Cox, although Mr. Stocker appears to get all the credit for having discovered the leak.

The civil engineering corps has no feeling against Mr. Stocker, who, they

say, was considerate of his associates and simply obeyed orders, but the result has been to place the two bureaus in another of those all too common difficulties.

This was one of a very few cases where an officer of the bureau of construction and repair, the business of which is to build battleships and cruisers, has been detailed to perform work ordinarily executed by the civil engineering arm of the service.

A HUMILIATING RECORD.

BY WALTER J. BALLARD.

Twenty-six years ago 559 ships were engaged in the European grain trade of the port of San Francisco, of which 405 were foreign and 154 American; now the number is only 31 and all of those are foreign ships. For three years not a single American ship has been engaged in the trade, and only one each in the years 1904 and 1905.

Here is the humiliating record:

Foreign		
Year.	American Ships	Ships.
1882.....	154.....	405
1887.....	55.....	227
1892.....	39.....	234
1897.....	24.....	226
1902.....	8.....	208
1903.....	2.....	135
1904.....	1.....	86
1905.....	1.....	51
1906.....	.....	29
1907.....	.....	50
1908.....	.....	31

While naturally, California's increased home consumption of grain, owing to her rapidly increasing population, renders the quantity available for export to Europe very small, yet the fact remains that that quantity, small as it is, is now carried entirely in foreign ships, because of the shortsightedness of Congress as to our need of an ocean-going marine.

A new passenger and cargo steamer for the Lamport & Holt Line's South American service was launched at the Dixon ship yard at Middlesbrough, Eng., Dec. 8. She was christened the *Vasari* and besides being very completely fitted for the carrying of enormous quantities of general cargo she will have luxurious accommodation for 200 first-class passengers and a large number of intermediate and third class passengers. The *Vasari* will trade in the company's New York, Brazil and Argentine Republic service. She is 502 ft. long, 59 ft. beam and 38 ft. 3 in. deep. Her engines, which were built by Richardson, Westgarth & Co., will give the steamer a speed of 14 knots or more.

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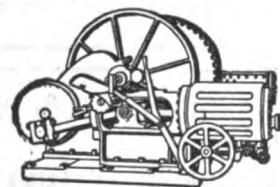
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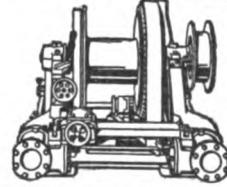
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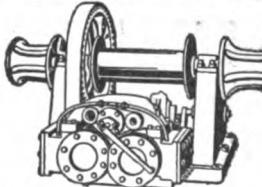
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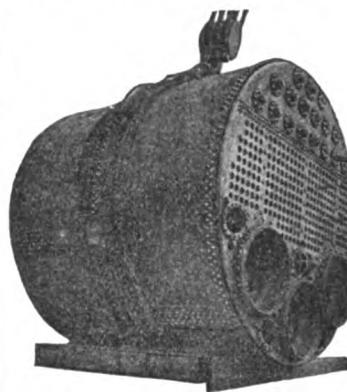
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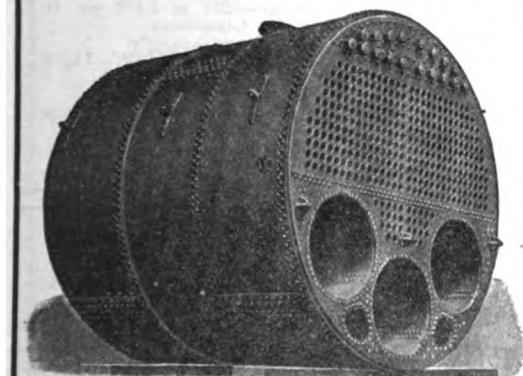
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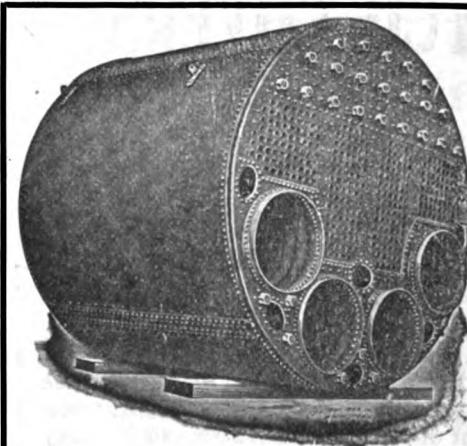
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PROPOSALS.—Sale of U. S. S. *Inca*.—Sealed proposals will be received at the Navy Department until noon on the 10th day of February, 1909, at which time and place they will be opened, for the purchase of the U. S. S. *Inca*, appraised value, \$5,300. The vessel will be sold for cash to the person or persons or corporation or corporations offering the highest price therefor above the appraised value thereof. *Proposals must be submitted in a sealed envelope addressed to the Secretary of the Navy, Washington, D. C., endorsed "Proposals for the purchase of the U. S. S. Inca," and each proposal must be accompanied by a satisfactory certified check for not less than 10 per cent of the amount of the offer.* On application to the Navy Department forms of bids and bonds, together with the terms and conditions of sale, also a printed list giving general information concerning the vessel, will be furnished. The vessel can be examined at any time after the date hereof by applying to the commandant of the Navy Yard, Boston, Mass. It must be removed from the limits of the navy yard within such reasonable time as may be fixed by the Department. The Department reserves the right to withdraw the vessel from sale and to reject any or all bids. H. L. SATTERLEE, Acting Secretary of the Navy. 1-7-09

U. S. Engr. Office, Boston, Mass., Jan. 6, 1909. *To whom it may concern:* Whereas navigation is obstructed and endangered by wrecks of steamers "Germania" and "Reindeer"; canal boats "Geo. D. Cull," "John R. Myers," "North Star," "E. D. Case," "Richmond," "William Parker," "F. J. Bailey," "Governor Roosevelt," "Georgie T." and "Armenia Allore," and by hulks of eight (8) other canal boats, names unknown, in the narrows of Lake Champlain, New York and Vermont: Notice is hereby given that unless otherwise removed within thirty days, they will be removed by the United States under authority of law. Sealed proposals for their removal will be received here until 12 M., Feb. 6, 1909, and then publicly opened. Information on application. Edw. Burr, Lieut. Col., Engrs.

TUG ARTHUR JONES FOR Sale, 16 x 18, 140 pounds steam, hull recently rebuilt and all in good working order. E. M. Graves, 17 Commercial Bank Bldg., Cleveland, O.

STEAMER AND CONSORTS FOR SALE. For the purpose of closing up some estates, the Pawnee Boat Co. offer the steamer Pawnee and consorts, M. E. Orton, J. R. Edwards and Wm. A. Young for sale. Now laid up at Port Huron, Mich. Address H. McMorran, Port Huron, Mich. Lumber capacity of the tow, 2-1/2 million.

BARGES DONALDSON AND Fannie Neil for sale, class A2 straight, carrying capacity of each boat 850 tons coal, 550 M. lumber. Donaldson laid up in Port Huron, Fannie Neil at Sarnia. Price for either boat, \$4,000. J. U. Karr, Cleveland, O.

STEAMER FOR SALE. FOR the purpose of closing up some estates, the Mills Transportation Co. offer the steamer Gogebic for sale. Now laid up in Buffalo. Address H. McMorran, Port Huron, Mich.

PASSENGER STEAMER CHEQUAMEGON. Built in 1903. Allowed 400 passengers. Triple-expansion engines. 175 lb. steam pressure. 125 ft. over all. 22 ft. beam. Electric lights. Search light. Steam steering gear. Draught, 8 ft. 10 in. Rated A1. Information and price apply to C. A. Webb, Traverse City, Michigan.

FOR SALE. ONE ROBERT WATER TUBE Boiler No. 9, repiped last spring. One F. & A. compound marine engine, 6 x 12 x 6. Built by the Marine Iron Works, Chicago, Ill. One Worthington Duplex Air Pump, 4 1/2 x 3 3/4 x 4. One Worthington Duplex Boiler Feed Pump 3 x 1 1/4 x 3. Outfit practically as good as new and will be sold cheap. Address H. B. Larsen, Manistee, Mich.

U. S. Engineer Office, Detroit, Mich., Dec. 21, 1908. Sealed proposals for building and furnishing wooden tug will be received at this office until 3 P. M., Jan. 21, 1909, and then publicly opened. Information on application. C. McD. Townsend, Lieut. Col., Engrs.

TUGS FOR SALE. STEEL TUG, now building, 105 ft. long overall, 21 ft. beam, 12 ft. 3 in. depth of hold. Engine 15 x 30 x 22, Scotch boiler, 150 lbs. steam. Coal capacity 80 tons. Also a tug 67 ft. long, of oak, 16 1/2 ft. beam, 7 1/2 ft. depth of hold. Single engine, 14 x 16. Boiler 6 1/2 ft. x 12 ft. for 130 lbs. steam pressure. Fresh water tanks forward and aft. Independent pumps. Keel Condenser. Also two small tugs, not new. Address McIntyre & Henderson, foot of Montgomery St., Baltimore, Md.

COMBINED FREIGHT AND PASSENGER STEAMER "Japan" for sale, gross tonnage 1239; allowed 200 passengers; keel 210 ft., beam 32 ft. 6 in., depth 14 ft.; iron hull, bottom of hull wood sheathed. Laid up at Buffalo, N. Y. Also iron freight steamer "Alaska," for sale; gross tonnage 1288; equipped for handling package freight; keel 212 ft. 6 in., beam 32 ft., depth 13 ft. 9 in. Laid up at Erie, Pa. For further information and prices apply to J. C. Evans, Western Manager, The E. & W. T. Co. (Anchor Line), Buffalo, N.Y.

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